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Technical Report 922

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Army Synthetic Validity Project

Report of Phase III Results
Volume I

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February 1991

United States Army Research Institute
for the Behavioral and Social Sciences

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U.S. ARMY RESEARCH INSTITUTE
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UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS --
2a. SECURITY CLASSIFICATION AUTHORITY -- 2b. DECLASSIFICATION / DOWNGRADING SCHEDULE --	3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
4. PERFORMING ORGANIZATION REPORT NUMBER(S) --	5. MONITORING ORGANIZATION REPORT NUMBER(S) ARI Technical Report 922
6a. NAME OF PERFORMING ORGANIZATION American Institutes for Research 6b. OFFICE SYMBOL (If applicable) --	7a. NAME OF MONITORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences
6c. ADDRESS (City, State, and ZIP Code) 3333 K Street, NW Suite 300 Washington, DC 20007	7b. ADDRESS (City, State, and ZIP Code) 5001 Eisenhower Avenue Alexandria, VA 22333-5600
8a. NAME OF FUNDING / SPONSORING ORGANIZATION U.S. Army Research Institute for the Behavioral and Social Sciences 8b. OFFICE SYMBOL (If applicable) PERI-R	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER MDA903-87-C-0525
8c. ADDRESS (City, State, and ZIP Code) 5001 Eisenhower Avenue Alexandria, VA 22333-5600	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. 62785A PROJECT NO. 791 TASK NO. 2201 WORK UNIT ACCESSION NO. C01

11. TITLE (Include Security Classification)
Army Synthetic Validity Project: Report of Phase III Results
Volume I

12. PERSONAL AUTHOR(S) Wise, Lauress L. (AIR); Peterson, Norman G. (PDRI); Hoffman, R. Gene, and Campbell, John P. (HumRRO); and Arabian, Jane M. (ARI)

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM 89/12 TO 90/10	1991, February	506

16. SUPPLEMENTARY NOTATION
Contracting Officer's Representative, Jane M. Arabian. Personnel Decisions (Continued)

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Synthetic validation; Job description; Standard setting; Project A; ASVAB

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The Army Synthetic Validity Project developed and evaluated a series of alternative procedures for (a) analyzing critical components of jobs, (b) obtaining expert judgments of validities of individual attributes for predicting critical performance components, (c) establishing prediction equations for specific jobs when criterion-related validation data were not available, (d) estimating criterion-referenced performance standards for specific jobs, and (e) specifying scores on the predictor battery necessary to achieve the desired performance standard, given the bivariate distribution between predictor scores and performance scores. The results and conclusions obtained for each of these activities follow.

As a consequence of results obtained in earlier phases of the project, the attribute model and the job behavior method were set aside and the questionnaire based on tasks performed became the tool of choice. While all methods provided reliable descriptions
(Continued)

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL Jane M. Arabian	22b. TELEPHONE (Include Area Code) (202) 274-8275 22c. OFFICE SYMBOL PERI-RR

DD Form 1473, JUN 86 Previous editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

16. SUPPLEMENTARY NOTATION (Continued)

Research Institute (43 Main St., S.E., River Place Suite 405, Minneapolis, MN 55414) and Human Resources Research Organization (1001 S. Washington St., Alexandria, VA 22314) are subcontractors of American Institutes for Research.

19. ABSTRACT (Continued)

the task questionnaire yielded greater discriminability across MOS and had higher acceptability among the judges.

Judgments about the validity of human attributes for predicting job descriptor elements proved to be particularly robust across judges, who differed across a fairly wide range of relevant psychological training and experience.

The synthetic validation methods produced equations that have only slightly lower absolute validities than least squares equations developed directly on the jobs, depending on the criterion and method of forming the synthetic equation.

The most significant conclusion of the standard setting research was that the different methods developed and evaluated led to different results. Very strict standards were set when performance was described in terms of "percent go" scores on hands-on task performance tests.

Researchers developed a computer program to demonstrate the linkage between test scores and acceptability levels. The program uses a database with the linkage relationships estimated for the MOS included in this project. This database includes performance cut scores for each MOS and also regression slope, intercept, and error variance parameters. The user may vary additional parameters to obtain the percentage of recruits expected to perform at each level of acceptability.

Other research related to this phase of Project A appears in ARI Research Product 91-08, Army Synthetic Validity Project: Report of Phase II Results. Volume II: Research Instruments.

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Department of the Army

February 1991

Army Project Number
2Q162785A791

Manpower, Personnel, and Training

Approved for public release; distribution is unlimited.

FOREWORD

In 1980 the Assistant Secretary of Defense directed all services to pursue a long-range systematic program to validate the Armed Services Vocational Aptitude Battery (ASVAB) and to reevaluate enlistment standards against on-the-job performance. As a result, the Army has been investigating the validity of the ASVAB, as well as several new predictor measures, for a sample of 20 diverse military occupational specialties (MOS). This effort, known as Project A, has been very successful in validating the ASVAB, as well as providing the Army with a greater understanding of knowledge, skills, abilities, and other personal characteristics (KSAOs) required for these 20 MOS.

A major question now facing the Army is how to extend the wealth of data collected for Project A to the other 250-plus entry-level Army MOS and to new MOS created for new hardware systems as they become operational. A second challenge is to determine the methods needed for setting job performance standards that can be used in making selection and classification decisions.

The Army's Synthetic Validity Project (SYNVAL) addresses these challenges. Specifically, the objectives of SYNVAL have been to (a) evaluate synthetic validation techniques for determining MOS-specific selection composites for each MOS; and (b) evaluate alternative methods for setting minimum qualifying scores on each of these composites. The research proceeded in three iterative phases. The third and final phase was recently completed. This document provides information on Phase III research plans, objectives, and results.

Based on the results of the evaluations, recommendations have been made for the most promising approaches for (a) methods for developing job performance prediction equations for all of the Army's 250-plus entry-level MOS; and (b) methods for setting performance standards for these MOS. The technical quality of this project was guided by the Scientific Advisory Committee: Phil Bobko (Chair), Robert Linn, Richard Jaeger, Joyce Shields, and Robert Guion.

Edgar M Johnson

EDGAR M. JOHNSON
Technical Director

ARMY SYNTHETIC VALIDITY PROJECT:
REPORT OF PHASE III RESULTS
Volume 1

EXECUTIVE SUMMARY

Requirement:

For new military occupational specialties (MOS) and for many existing MOS, empirical research to identify and validate an optimal composite of selection measures for a particular Army enlisted MOS cannot always be carried out. The selection problem is compounded when estimates are needed for the validity of the composite for predicting job performance, and when minimum qualifying scores and appropriate cut scores for other critical selection decisions are needed.

Procedure:

The Synthetic Validity Project was directed at overcoming this problem by identifying and evaluating alternative procedures for (a) identifying an optimal composite of selection measures for any Army MOS and estimating the validity of this composite for predicting job performance; and (b) setting a minimum qualifying score, or standard to assure a reasonable probability of successful job performance, as well as cutting scores for other critical selection decisions (e.g., for selecting recruits with potential for outstanding performance).

There are three research phases in the Project. In each phase, synthetic validation procedures and standard setting procedures were developed or refined and then tried out on a new sample of MOS.

For the Phase III synthetic validation portion of the research, a major goal was to replicate and extend procedures for generating synthetic prediction equations for 18 MOS. The Army Task Questionnaire was used to obtain job description judgments. Predictors were linked via expert judgment to the job components. Various ways of generating prediction equations were investigated.

For the Phase III standard setting research, the task-based and critical incident methods for setting standards were refined. These procedures were further developed to better identify job performance standards for each job and to link these standards to scores on the predictor composite for that job.

Finally, computer software was developed to demonstrate the linkage between test scores and job performance acceptability levels.

Findings:

- As a consequence of the results obtained in earlier phases of the project, the attribute model and the job behavior method were set aside and the Army Task Questionnaire became the tool of choice for use in synthetic validation. While all methods provided reliable descriptions, the task questionnaire yielded greater discriminability across MOS and seemed to have higher acceptability among the judges.

- The synthetic validation methods produced equations that have only slightly lower absolute validities than least squares equations developed directly on the jobs themselves, depending on the criterion and method of forming the synthetic equation.

- The most significant conclusion of the standard setting research was that the different methods that we developed and evaluated led to different results. Very strict standards were set when performance was described in terms of "Percent Go" scores on hands-on task performance tests.

- We developed a computer program to demonstrate the linkage between test scores and acceptability levels.

Utilization of Findings:

The synthetic validation approach provides feasible methods to develop a prediction equation for MOS for which empirical data are not available. Based on the research described here, there are several good options available but no clear-cut choice between them. The synthetic method and validity transportability methods produced absolute validities over .60.

Specific procedures for scaling standards of performance is also feasible. Both the task-based and behavioral incident standard setting instruments provided reliable data. When developing standards, job experts should fully understand the objectives and the consequences of the standard setting exercise. It seems likely that the frame of reference for the judgments will influence the level of performance designated as the standard.

ARMY SYNTHETIC VALIDITY PROJECT: REPORT OF PHASE III RESULTS
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ARMY SYNTHETIC VALIDITY PROJECT:
REPORT OF PHASE III RESULTS
Volume I

Chapter 1: Introduction and Overall Objectives

John P. Campbell (HumRRO) and Lauress L. Wise (AIR)

The two major objectives of the Army Synthetic Validity Project are to identify and evaluate procedures for

- identifying an optimal composite of selection measures for any Army enlisted Military Occupational Specialty (MOS) and estimating the validity of this composite for predicting job performance, and

- setting a minimum qualifying score so as to assure a reasonable probability of successful job performance, as well as other appropriate cutting scores for other critical selection decisions (e.g., for selecting recruits with potential for outstanding performance).

Synthetic validation approaches typically begin with the identification of a set of job components that can be used to describe the population of jobs being studied. A prediction equation is derived for linking available selection tests to each component. Subject matter experts (SMEs) are asked to identify the importance of each component to overall job performance. Finally, the prediction equations for the various components are weighted according to the importance judgment weights and summed to obtain an equation for predicting overall performance for the job.

The standard setting task of the Synthetic Validity Project is charged with developing procedures for specifying minimum qualifying scores and other appropriate cut scores on the predictor composites identified for each job. Procedures are being developed for identifying job performance standards for each job, and these performance standards will then be linked to scores on the predictor composite for that job.

The Army Context

The critical importance of the Synthetic Validity Project's objectives flow directly from the complexity of the Army's personnel management tasks, which are both difficult and subject to more severe constraints than virtually any other large organization. For example, during the past 10 years approximately 400,000 - 500,000 people have applied each year for 110,000 - 130,000 openings. The available openings are distributed unevenly across approximately 275 different jobs ranging from infantryman to helicopter mechanic to paramedic to administrative/clerical specialist. Each new accession goes

immediately to basic training and then to advanced training in his or her chosen specialty. The number of training slots that will be available is budgeted at least one year in advance, and many cost/benefit parameters are optimized if every seat is filled with appropriate people on the day the class starts. The individual MOS assignment is a function of training seat availability at a particular time, the current priority for "filling" the MOS, the individual's preference, and whether or not the individual's scores on the Armed Services Vocational Aptitude Battery (ASVAB) meet certain cutoffs. This is a complex decision process which must take place very quickly and is made on the basis of a relatively small amount of information. External issues about which the Army must be concerned are the fluctuating labor supply with its current downward trend and the ups and downs of the federal budget which have a direct effect on resources devoted to recruiting and the resulting nature of the applicant pool. At the same time, new equipment and new systems have been developed and the technical content and ability requirements of almost all MOS have increased markedly. A more recent constraint is the reduction in the number of new accessions resulting from changes in the global political context.

As a consequence of all of the above, optimal selection and classification have become more critical than ever. Reduced resources place an even greater premium on accurate selection and effective classification. At the same time, there is constant pressure on all the defense services to provide evidence that their personnel decision-making procedures are appropriate and valid. As an organization, the Army is a very large and very visible employer.

Projects A and B

The Synthetic Validity Project is functionally related to two other research and development projects aimed at improving the Army's selection and classification decision making procedures: Project A and Project B.

Project B

Project B is based on theory and method in econometrics and operations research. It has developed the models and software for an enlisted personnel assignment system that takes into account:

- forecasts of the future applicant supply
- forecasts of personnel needs in each MOS
- hiring goals for different subpopulations
- the rate at which training class slots are currently filling

- the MOS priorities designated by the Army
- the differential utility of different expected levels of performance within and across MOS
- the level of selection accuracy and differential prediction across MOS provided by the predictor battery.

Project B is intended to produce a state-of-the-art algorithm for optimizing personnel decisions, given certain goals, and for conducting a wide variety of "what if" exercises regarding changes in labor supply, priorities, utilities, and criterion content.

Project A

Project A is a very large personnel selection and classification validation project that was intended to use a sample of jobs (MOS) from the entire population of enlisted MOS to validate both the existing test battery (ASVAB) and a battery of newly developed selection/classification tests against a comprehensive set of performance measures. The major research issues revolved around:

- how to define and measure job performance
- the tradeoff between the number of jobs vs. the sample size for each job, given that resources did not permit drawing a sample from each of the 275 MOS
- identification of predictor domains with the highest potential for adding selection validity and classification validity to the existing ASVAB
- how specific variables should be targeted to represent each critical domain for predictor development
- how performance measures should be aggregated into composites for validation purposes
- how the utility of performance acrcss MOS can be scaled
- how to choose optimal predictor batteries for different goals (e.g., maximizing performance vs. minimizing attrition)
- how to choose predictor batteries and estimate validity for jobs (MOS) for which no empirical data could be obtained.

The Project A data base is critical for certain steps in the Synthetic Validity Project procedure, and it is briefly summarized in the following sections.

Design and method. To pursue the project's objectives while addressing the above issues, the following design was used in Project A. There were two major validation samples: (a) a concurrent validation (CV) sample was taken from the cohort of 1983/84 enlistees into 19 MOS and measured on both the new predictors and new criterion measures in 1985; and (b) a longitudinal validation (LV) sample was assessed on the predictors when they entered the Army in 1986/87 and tested on the performance measures in 1988/89. This second sample included three additional MOS with one CV MOS deleted for a total of 21 MOS. Each sample consisted of approximately 250 to 750 people with the MOS selected to be representative of the entire population of enlisted MOS. Consequently, from each sample predictor and criterion measurement data is available for approximately 10,000 individuals.

Criterion measures were developed by conducting an extensive task analysis and critical incident analysis of each MOS. All available sources and multiple expert reviews were used to generate a full listing of all tasks in each MOS as well as judgments about the criticality and difficulty of each task and the similarity among tasks. For a representative sample of critical tasks in each MOS, job sample (hands-on) exercises, paper-and-pencil knowledge tests, and rating scales were developed. The critical incident analysis produced a complete set of performance dimensions for each MOS, and behavioral rating scales were developed for each of the dimensions that survived the critical incident retranslation and SME reviews. In addition, rating scales were developed to assess expected performance in combat. Finally, existing administrative records were examined and six variables retained as performance indicators (e.g., number of awards and letters of commendation). The full performance assessment required 12 hours per individual.

Potential new predictor variables were selected through a painstaking process of literature search, expert review, and evaluation of previous research. The goal was to produce a four-hour battery of new tests that would maximize the chances of improving selection/classification accuracy for the entire system (i.e., population of MOS). In the end, the domains from which the experimental predictors were sampled were the following (in addition to the ASVAB):

- spatial ability
- perceptual speed and accuracy
- psychomotor abilities
- personality/temperament
- vocational interests
- biographical history

The major steps in the analysis were directed first at developing a basic set of predictor scores from the four-hour battery, a basic set of performance scores from the 12 hours of criterion assessment, and a model of performance that would account for the covariances among criterion scores. Then the correlations between each predictor score and each criterion score for each MOS were calculated, and an analysis of differential prediction across criterion dimensions within MOS (e.g., do different measures predict different dimensions of performance for given jobs) and across MOS for each major criterion dimension (e.g., do different measures predict the same dimension of performance for different jobs) was carried out.

Results. After analysis of the CV sample data, the subtests of the ASVAB plus the four-hour battery of experimental tests were arrayed into 24 predictor scores. They are listed in Figure 1.1.

On the basis of the CV sample, the multiple performance measures were first aggregated into 28 to 31 basic criterion scores (depending on the MOS) by means of expert judgment panels and exploratory factor analyses. A confirmatory analysis procedure was then used to test the fit of these basic scores with alternative models of the latent criterion structure. The best fitting model included five content factors and two method factors. They are shown as Figure 1.2.

The concurrent validation analyses generated a 24 (predictors) by 5 (criteria) matrix of validity coefficients for each MOS. These matrices were examined for the level of average validity, for profiles of validities across predictors for each criterion factor, for patterns of validities across the five factors within MOS, and validity patterns across MOS for each of the five criterion factors. The following conclusions summarize the results:

- Each of the five criterion factors can be predicted with considerable accuracy but not by the same predictors.

- There is considerable differential prediction across criterion factors within each MOS. This suggests that different goals could be emphasized in selection/classification (e.g., maximizing technical performance vs. minimizing discipline/motivational problems).

- The only criterion factor to show significant differential prediction across MOS was the core technical performance factor. For the other four performance components, the same predictor profile was found in each MOS.

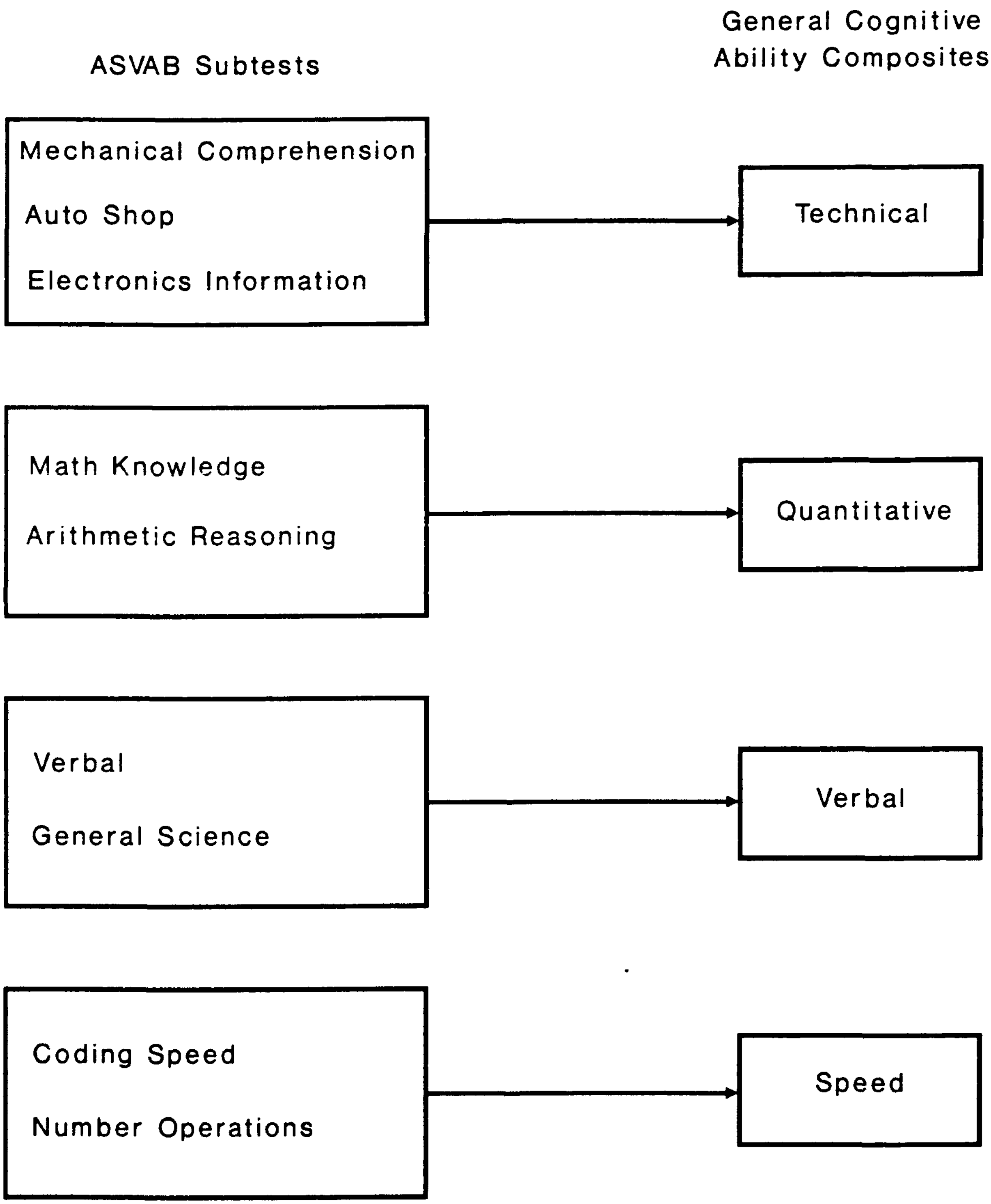

Figure 1.1. Project A test content and predictor composite scores.

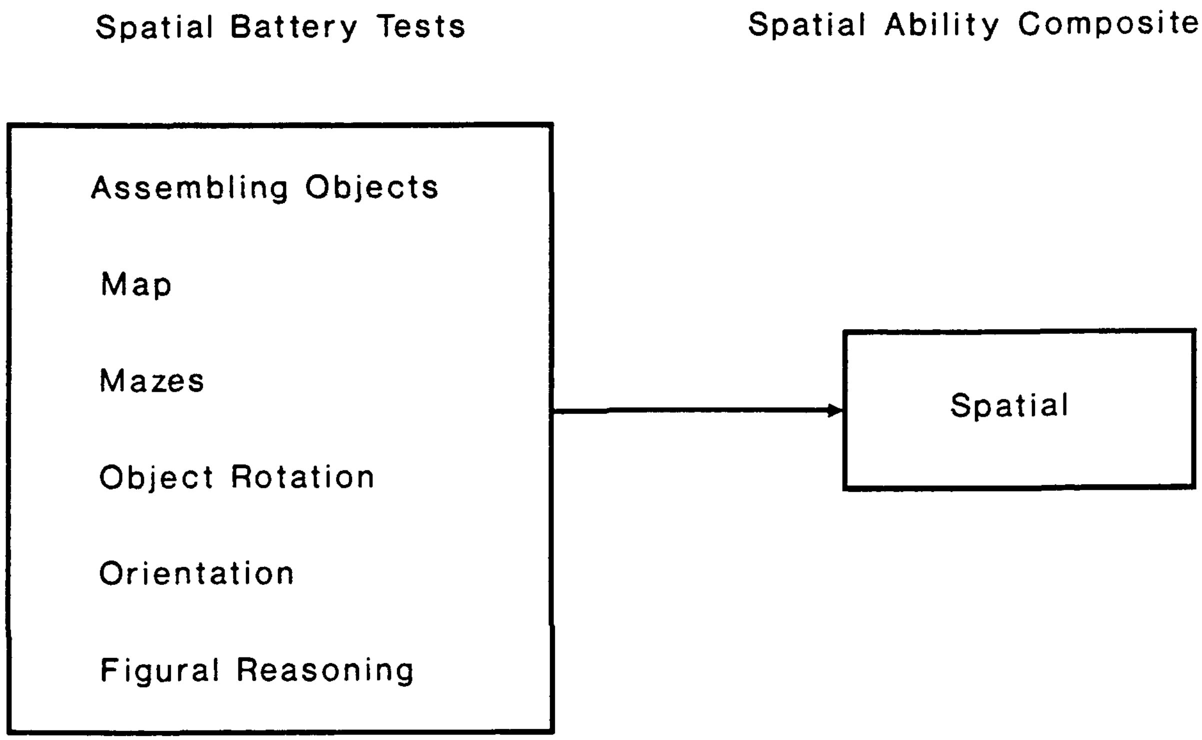

Figure 1.1. Project A test content and predictor composite scores (continued).

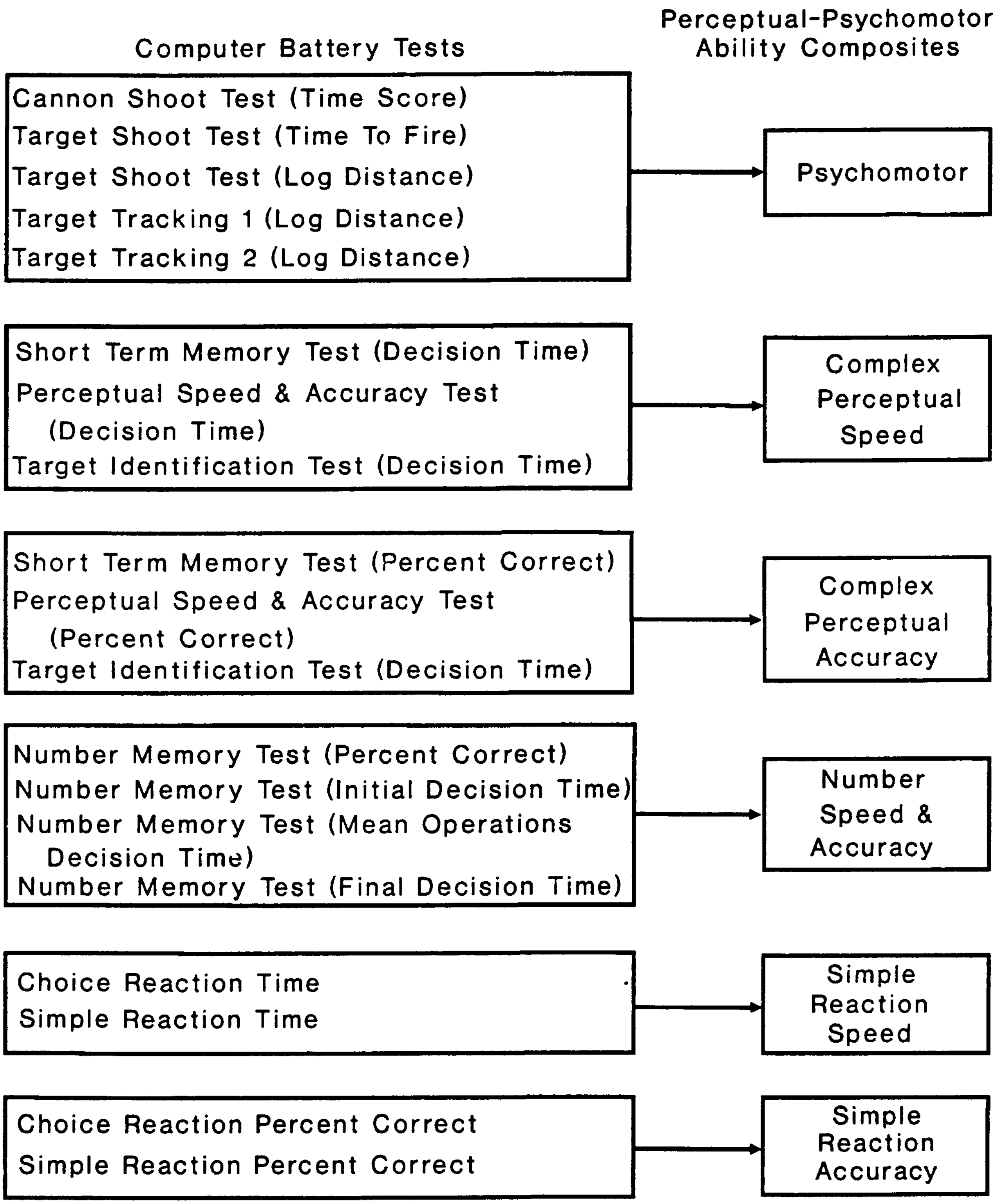

Figure 1.1. Project A test content and predictor composite scores (continued).

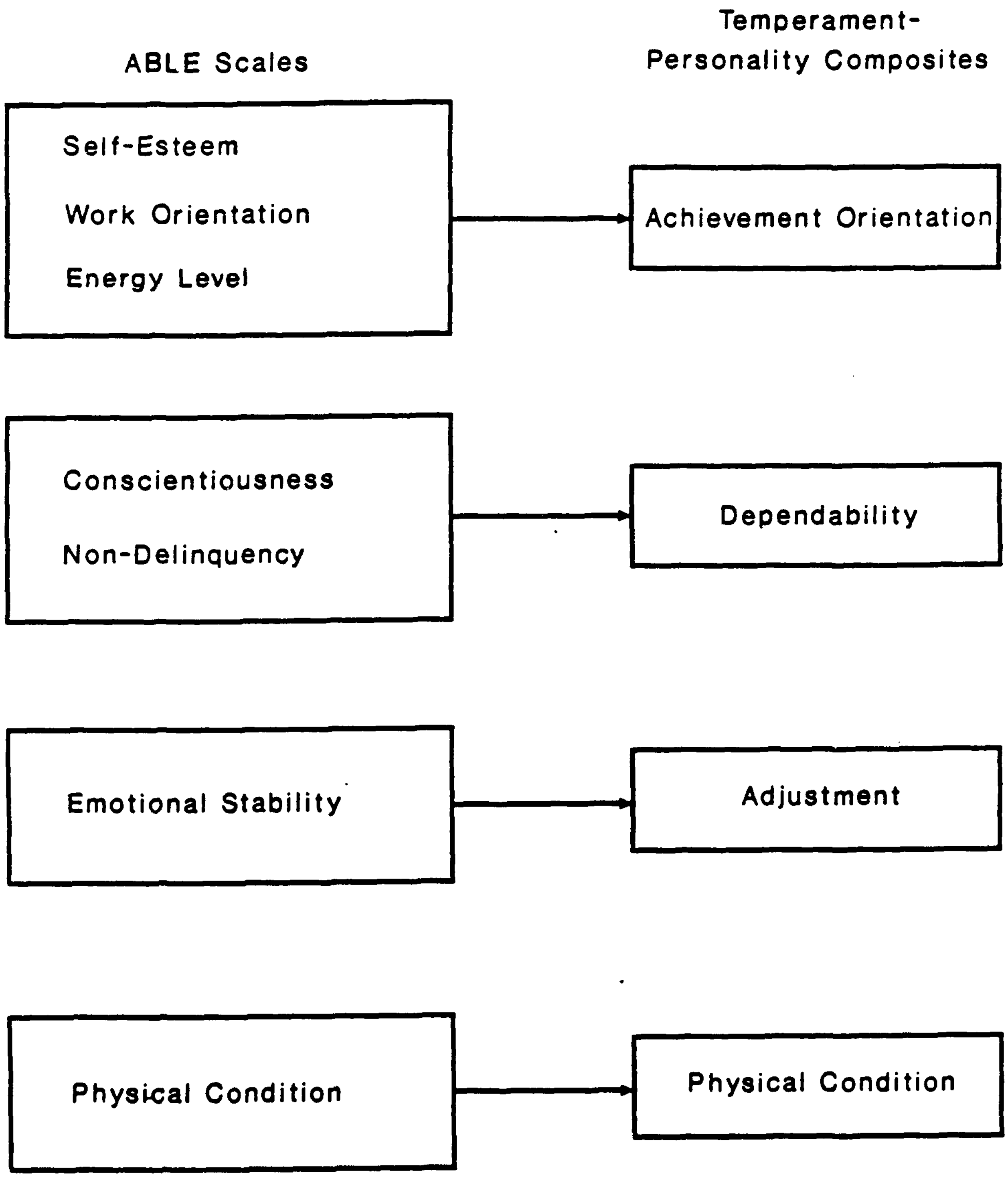

Figure 1.1. Project A test content and predictor composite scores (continued).

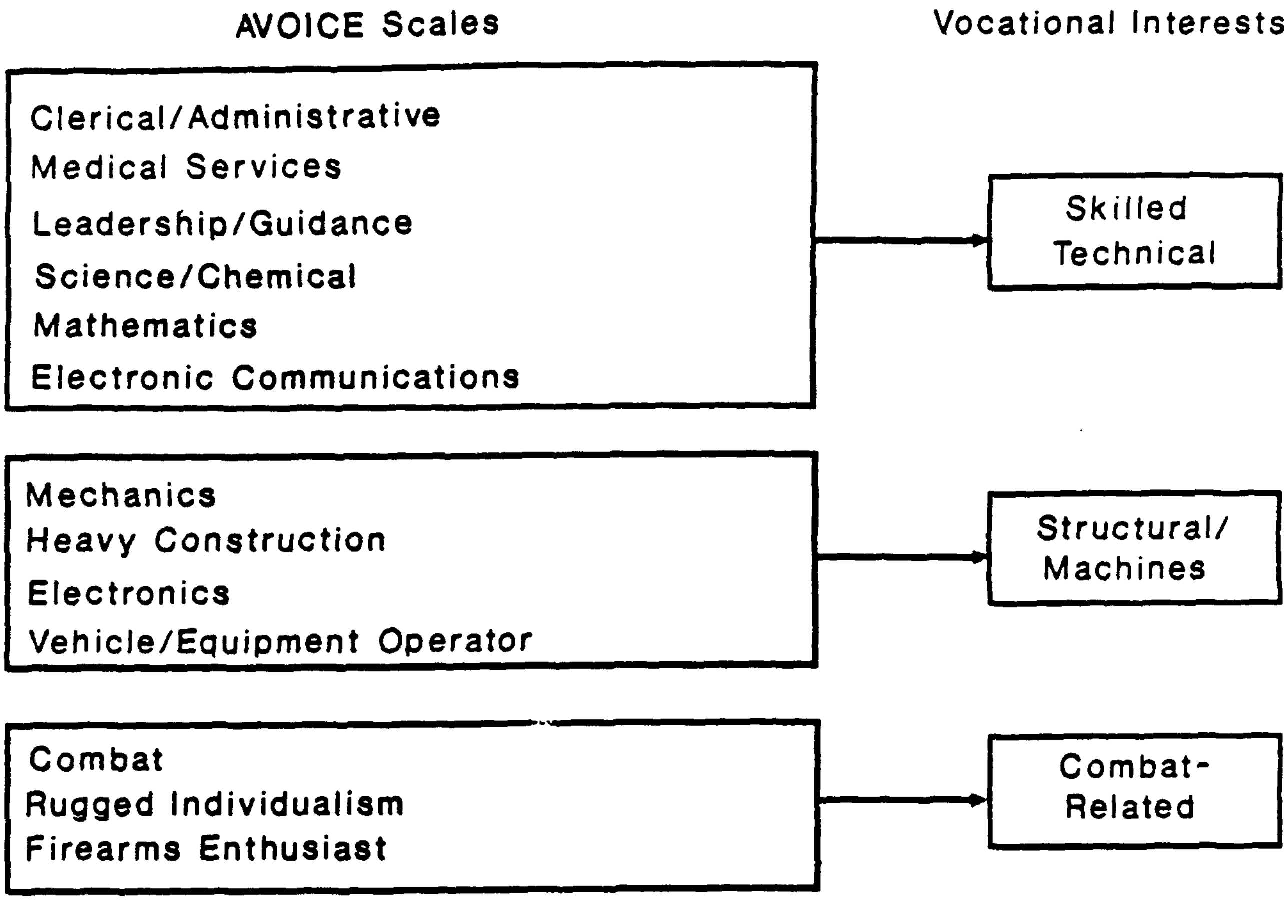

Figure 1.1. Project A test content and predictor composite scores (continued).

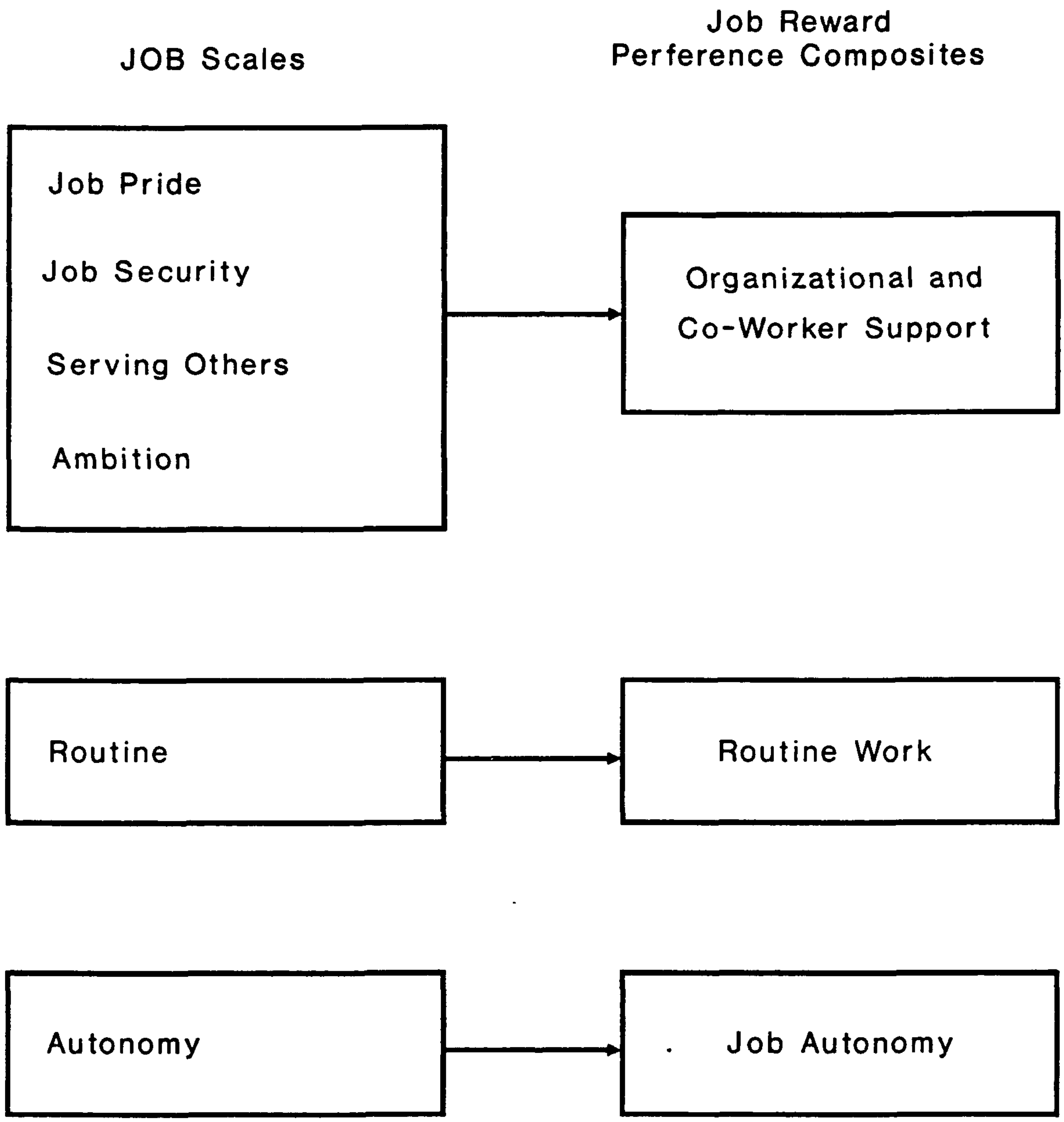

Figure 1.1. Project A test content and predictor composite scores (continued).

	Latent Performance Constructs							
	Content Constructs					Method Constructs		M16
Criterion Measures	Core Technical Proficiency	General Soldiering Proficiency	Effort/ Leadership	Personal Discipline	Physical Fitness/ Military Bearing	Written Knowledge Tests	Rating Scales	M16 Qualification
AWB Effort			X				X	
AWB Discipline				X			X	
AWB Fitness					X		X	
AWB Overall			X	X			X	
MOS Technical			X				X	
MOS Other			X				X	
Cmbt Perform Well			X				X	
Cmbt Avoid Mistakes			X	X				
Adm Awards/Certs			X					
Adm Phys Readiness					X			
Adm M16								X
Adm Articles 15				X				
Adm Promotion Rate				X				
HO Technical	X							
HO Communications		X						
HO Vehicles		X						
HO General Soldier		X						
HO ID Threat/Target		X						
HO Safety/Survival		X						
JK Technical	X					X		
JK Communications		X				X		
JK Vehicles		X				X		
JK General Soldier		X				X		
JK ID Threat/Target		X				X		
JK Safety/Survival		X				X		
SK Technical	X					X		
SK Communications		X				X		
SK Vehicles		X				X		
SK General Soldier		X				X		
SK ID Threat/Target		X				X		
SK Safety/Survival		X				X		

Note. AWB = Army Wide BARS; HO = Hands-on; JK = Job Knowledge; SK = School Knowledge.

Figure 1.2. Mapping of performance measures into performance constructs.

The Basic Issue

Using Project A results, optimal prediction equations can be developed for 21 MOS, and classification efficiency can be examined across the same 21. However, the Army must select and assign people to approximately 275 MOS. When implemented, the Project B algorithm, or one like it, must lead to a decision for all applicants. Because individual allocation decisions must be made in real time, it is not possible to optimize personnel assignments for a particular period via batch processing. To make decisions in real time, the system needs meaningful "standards" for each MOS that specify the optimal constraints.

Obtaining Prediction Equations for All MOS

There are three major ways to approach this issue:

- Empirical validation could be carried out for all 275 MOS

- Because the 21 MOS were selected to be representative of clusters of MOS judged to be similar in content within each cluster, validity generalizations could be assumed within each cluster and examined empirically across the 21. That is, the significant differential prediction across MOS for the Core Technical Proficiency (CTP) factor may be accounted for by fewer than 21 equations.

- A synthetic validation procedure could be used to select a predictor battery for each MOS. The 21 MOS in the Project A sample provide a means for empirically validating any such synthetic procedures.

The latter strategy is the focus of the Synthetic Validity Project. If a successful synthetic validation procedure could be developed, it would provide a less costly way (and perhaps the only feasible way) of developing selection/classification procedures for new MOS, for MOS that have undergone significant changes, or for MOS that have relatively few people in them.

Setting standards. An analogous set of possible procedures could be used to develop performance standards and concomitant selection standards for individual MOS. Performance scaling and empirical selection standards could be developed for each job, the standards for the focal job in a cluster could be generalized to all other MOS in the cluster, or a synthetic procedure could be developed for inferring standards on jobs for which empirical data are not available.

The remaining chapters in this report describe the major parts in this synthetic validation and standard setting effort, a brief overview of which is given below.

A General Overview of the Army Synthetic Validity Project

The "synthetic validity" approach was first introduced by Lawshe (1952) as an alternative to the situational validity approach, which requires separate validity analyses for each job in the organization. Balma (1959) defined synthetic validity as "discovering validity in a specific situation by analyzing jobs into their components, and combining these validities into a whole."

Guion (1976) provides a review of several approaches to conducting synthetic validation. The approach most relevant to the problem at hand involves:

- identifying job components that are common across a range of jobs
- using criterion-related validity information or expert judgment to estimate the validity of potential predictors of each component of job performance
- developing predictor composites for each job by combining the prediction equations for each of the job components that are relevant to the job.

The usefulness of this variant of synthetic validation depends on three critical operations.

First, a set of components must be identified that cover all important aspects of performance in all enlisted jobs. The taxonomy of job components must be reasonably exhaustive of the job population such that the critical parts of any particular job can be described completely by some subset of the complete taxonomy of all relevant components. In addition, there must be a group of subject matter experts (SMEs) available who understand these components well enough to provide reliable and accurate importance or relevance weights for the components in a particular job.

Second, it must be possible to establish equations for predicting performance on each component from current or potential selection measures. The prediction equation for a given component must be independent of the particular job for which the component is judged relevant. Either empirical or a combination of empirical and judgment-based procedures must be used to establish the predictive relationships for each component. There also must be reliable differences between the prediction equations for different components. To the extent that the same measures predict all components of performance, the overall prediction equations will necessarily be the same across jobs. In such a case a validity generalization model would apply, and there would be no basis for differential classification.

Third, synthetic validation models assume that overall job performance can be expressed as the weighted or unweighted sum of individual performance on the critical components. Composite prediction equations are typically expressed as the corresponding sum of the individual component prediction equations. To estimate the validity of the composite prediction equation, validity estimates for the predictors of each component are needed and some further assumptions are required. Most typically, it is assumed that errors in estimating different components of performance are uncorrelated.

While the bulk of the literature on synthetic validation comes from studies done in industry (Mossholder & Arvey, 1984), the extant literature on standard setting has been generated largely within an educational context. The concern has been either with criterion referenced testing of student achievement or with certification standards for teachers. Within this context there are three principal issues: (a) the relevance and completeness of the content sampled for measurement, (b) the validity of the response capability (e.g., declarative knowledge vs. procedural skill) incorporated into the measurement method, and (c) the method used to provide criterion referenced scale values for selected points on the performance continuum. This literature has been reviewed by Hambleton (1980) and more recently as part of this project by Pulakos, Wise, Arabian, Heon, and Delaplane (1989).

For the Army, a critical issue is the identification of the appropriate individuals (i.e., expert judges) to impose performance standards on the existing performance distribution or to scale performance scores in terms of defined standards. The literature indicates that not all standard setting procedures produce the same results. The purpose of the current project is to identify the method(s) which maximize reliability, relevance, and acceptability in the context of setting standards for first tour performance and selection standards for entry into specific MOS.

Project Design

The general design of the Synthetic Validity Project has been as follows. After a thorough literature search, we outlined a set of alternative methods for describing job components. These were based on our own and previous work in constructing taxonomies of human performance (e.g., Fleishman & Quaintance, 1984). Four principal kinds of components or descriptive units for analyzing jobs were initially proposed: behavior description approaches (e.g., handling objects), behavior requirements approaches (e.g., decision making), ability requirements approaches (e.g., finger dexterity), and task characteristics approaches (e.g., fires main gun).

After an initial review of alternative types of components, we decided to combine behavior requirements and ability requirements and to proceed with three approaches. The first was a Job Behaviors Model. The components were defined as general job behaviors that are not task specific, but which can underlie several job tasks. Examples might be "recalling verbal information" or "driving heavy equipment." For this approach we attempted to identify a set of performance behaviors that can be meaningfully linked to predictor measures. Some concerns were that it may be difficult to develop the taxonomy of behavior in sufficient detail to be useful, that the judgments of job relevance may be difficult, and that general "behaviors" as descriptors may not be accepted by those making the judgments.

The descriptive units in the second approach were Job Tasks. An initial list of performance tasks was developed in Project A from duty area descriptions for the 111 enlisted jobs with the largest number of incumbents. These descriptions provided a basis for defining job components that are clusters of tasks rather than behaviors within tasks. The chief advantages of this model were a close match to previous empirical validity data and the familiarity of SMEs with these kinds of descriptions. The primary concerns were that the taxonomy may not be complete enough to handle new jobs and that the relationships of job component performance to individual predictors may be difficult to determine reliably and accurately.

The third approach was called the Individual Attribute Model. In this approach, the components were job requirements described in terms of mental and physical abilities, interests, traits, and other individual difference dimensions. This model eliminated the need to establish links between predictors and job components because the attributes; (job requirements) are the predictors. The chief concerns with this approach was that there may be no SMEs who know enough about both the job and the human attribute dimensions to describe job requirements accurately and that this approach may not be as acceptable as a method based on more specific job descriptors.

Again, one major objective of the project has been to evaluate the alternative models in terms of how well they help meet the Army's needs for selection and classification decision procedures for each MOS.

The investigation of standard setting also used three general approaches. First, judges were asked to give a direct estimate of the percentage of individuals in the current force who meet certain specified standards (e.g., marginal - marginal individuals need additional training and skill development or they should not stay in the Army). Second, a sample of critical incidents of performance were judged/scaled in terms of the absolute level of performance that each represented. Third, task performance, portrayed as the results obtained from administering standardized task tests (such as used in Project A), was also

scaled by judges in terms of the standard of performance represented by various score levels.

Given these three different approaches to standard setting, the Synthetic Validity Project has systematically investigated the reliability of such judgments, the agreement across methods and variations within methods, the reactions of the judges to each method and the comparative results of general versus specific standards. The standard setting investigation has also included a comparison of various combinatorial rules for aggregating component standards and methods for inferring selection standards from performance standards.

Procedure

The Synthetic Validity Project has followed an iterative procedure. This iterative approach provides an opportunity for revisions of the models and research methods followed by evaluation of a more refined version of each approach. The design specified first a series of exploratory workshops to assess the completeness and clarity of each of the alternative procedures followed by three phases of further development and evaluation. In Phase I, initial procedures were tested for three of the Project A MOS. In Phase II, revised procedures were tested for seven more Project A MOS. The final revisions of the procedures were tested in Phase III using 10 Project A MOS and one MOS not sampled by Project A.

Throughout the project design, the emphasis has been on the identification and evaluation of alternative approaches to the implementation of synthetic validation and standard setting procedures. We evaluate the extent to which each model can meet the requirements for effective synthetic validation and standard setting. In the course of doing that, we compare the results produced by different types of judges who evaluated the relevance of the different types of components and scaled the acceptability of different performance levels for the target jobs. The judgments produced by the type-of-judge/type-of-component combinations are compared in terms of their distributional properties, interjudge reliabilities, discriminability, and acceptability.

Job Description Objectives and Findings

Phase I. The primary goal in Phase I for synthetic validation was to obtain and evaluate synthetic prediction equations for three MOS: 11B (Infantryman), 63B (Light-Wheel Vehicle Mechanic), and 71L (Administrative Specialist). Three steps were necessary to accomplish this goal. First, three job component models (consisting of tasks, activities, or attributes) were developed and used to obtain job description judgments. Predictors were then linked via expert judgment to the job components, and various ways of generating prediction equations were investigated. A second goal was to evaluate differences in

the job descriptions generated by different types of judges, that is, NCOs[1] versus Officers at FORSCOM[2] versus TRADOC[3] installations.

For synthetic validation, the completion of Phase I represented a major accomplishment for the project. First, it was demonstrated that synthetic validation can be successfully carried out for the three Phase I MOS investigated. Army SMEs were able to use the three job component models to reliably describe the content of these jobs. Table 1.1 shows, for the Task Category and Job Activity instruments, adequate single-rater reliability estimates of importance ratings for Core Technical Proficiency and Overall Job Performance. Table 1.1 also shows adequate reliability estimates for attribute validity ratings from soldiers and psychologists for Core Technical Proficiency. Using job description and job component validity information, prediction equations were formed that were valid for predicting Core Technical Proficiency for each of the three jobs (see Table 1.2). However, as Table 1.2 also shows, the prediction equations, on average, offered little or no discriminant validity[4]. That is, synthetic equations were similar such that the validity of an equation derived on one MOS and applied to a second MOS differed little, if any, from the validity of the equation derived on the second MOS. Both absolute and discriminant validities are lower than empirical validities.

Phase II. A principal objective of Phase II was to replicate the results from Phase I on a larger set of jobs: 16S (MANPADS Crewman), 19E/K (Armor Crewman), 67N (Utility Helicopter Repairer), 76Y (Unit Supply Specialist), 88M (Motor Transport Operator), 91A/B (Medical Specialist), 94B (Food Service Specialist). A fourth job descriptor model was developed which combined the task and activity models and was appropriately labeled the "hybrid" model. Further, the methodology for using the attribute model was expanded to include a rank ordering of the attributes in addition to attribute validity estimates. We compared the four job descriptor methods on a number of distributional and psychometric properties that could serve as indicators of their comparative value for synthetic validation. Three major parameters characterize the alternative methods: (a) type of descriptor (task, activity, hybrid, or attribute); (b) type of response scale (frequency, importance, difficulty, and validity estimates); and (c) type of expert judge (NCOs and Officers at FORSCOM and TRADOC installations). By comparing the

[1]Non-commissioned officers.

[2]Refers to operational units (Forces Command).

[3]Refers to training and doctrine units (Training and Doctrine Command).

[4]Mean diagonal minus mean off-diagonal"

Table 1.1

Reliability Estimates of Phase I Job Description Ratings and Validity Ratings

	MOS		
	11B	63B	71L
Task Category Importance for			
Core Technical Proficiency	.52	.36	.40
Overall Job Performance	.52	.43	.44
Job Activity Importance for			
Core Technical Proficiency	.36	.23	.43
Overall Job Performance	.36	.25	.34
Attribute			
Validity (Soldiers)	.31	.34	.45
Validity (Psychologists)	.42	.55	.52

Table 1.2

Comparing Synthetic and Empirical Composites Obtained in Phase I

Composites	Absolute Validity	Mean Discriminant Validity
Empirical Composites	.67	.17
Synthetic Composites		
Task Category	.55	.01
Job Activity	.53	.01
Attribute (Soldiers)	.52	.02
Attribute (Psychologists)	.58	.04

Note. Mean absolute validity was calculated by averaging across the three Phase I MOS.

job descriptor methods, we hoped to identify a single job component model: one that was reliable and yielded the optimal differential prediction among jobs.

As shown in Table 1.3, acceptable single-rater reliability estimates of importance ratings for Core Technical Proficiency and Overall Job Performance were obtained via the Task Category, Job Activity, and Hybrid instruments. Table 1.3 also shows sufficient reliability estimates for attribute validity ratings and rankings for Core Technical Proficiency.

Table 1.3

Reliability Estimates of Phase II Job Description Ratings and Validity Ratings

	MOS						
	16S	19K	67N	76Y	88M	91A	94B
Task Category Importance for							
Core Technical Proficiency	.46	.55	.54	.73	.50	.43	.43
Overall Job Performance	.56	.55	.56	.47	.48	.48	.44
Job Activity Importance for							
Core Technical Proficiency	.44	.37	.38	.24	.39	.26	.27
Overall Job Performance	.47	.35	.34	.22	.36	.27	.25
Hybrid Importance for							
Core Technical Proficiency	.41	.43	.38	.35	.44	.34	.33
Overall Job Performance	.46	.42	.39	.37	.42	.36	.34
Attribute Ratings							
Core Technical Proficiency	.21	.22	.30	.22	.21	.16	.15
Attribute Rankings							
Core Technical Proficiency	.38	.40	.53	.48	.38	.41	.37

In identifying a prototypical job descriptor model, we placed primary emphasis on the model's ability to produce predictor equations that provide acceptable validity for each job and adequate differential prediction among jobs. Four methods for forming criticality weights were explored which involved various combinations of frequency and importance ratings. Three variations of the criticality weights were investigated. These variations, labeled "threshold" methods, assigned non-zero criticality weights to components with mean frequency or core technical importance ratings that were above a specified cutoff (i.e., threshold). Table 1.4 shows Phase II absolute and discriminant validities for the different questionnaires and the

Table 1.4

Comparing Synthetic and Empirical Composites Obtained in Phase II

Composites	Mean Absolute Validity			Mean Discriminant Validity		
	V[a]	R[b]	U[c]	V[a]	R[b]	U[c]
Empirical Composites		.69			.08	
Synthetic Composites						
Task Category	.57	.33	.61	.01	.02	.02
Job Activity	.52	.30	.53	.01	.01	.01
Hybrid	.53	.32	.55	.01	.02	.02
Attribute Ratings	.51	.31	.52	.01	.03	.01

Note. Mean validities were calculated by averaging across the seven Phase II MOS, across the threshold models, and across the criticality variations.

[a]V = Validity estimates as predictor weights. [b]R = Regression derived predictor weights. [c]U = Unit weights for predictors.

different methods of deriving predictor weight. Except for the regression method validities, results are similar to Phase I. The Task Category model emerged as the prototypical job descriptor instrument primarily because it had higher absolute and discriminant validities than the other models, but also because it had adequate reliability levels and was acceptable to Army SMEs.

Standard Setting Objectives and Findings

Phase I. A major goal in Phase I standard setting was to investigate different procedures for setting performance standards. Performance level definitions were developed. Three standard setting methods were developed to obtain component standards. The first two methods reflect performance on tasks (Task-Based) and behavioral examples (Critical Incident-Based). The third method involves asking SMEs to directly estimate the percentage of soldiers who are currently performing at various levels of performance (Soldier-Based). A method was also developed for combining the component standards.

Army SMEs found the performance level definitions to be reasonable and workable. Many SMEs also reported that the outcomes of the performance levels were realistic. As Table 1.5

shows, the three methods for setting standards resulted in different standards. These methods also resulted in some differences in the degree of consensus among judges in setting the standards. Compared to the Critical Incident and Soldier-Based methods, the Task-Based method resulted in the strictest standards, which meant that it reported the highest proportion of unacceptable performance among incumbents. We also found that SMEs reported difficulties in providing task-based standards. In deriving an overall standard from component standards, there was evidence that a linear compensatory model accurately captures the judges' aggregation strategies.

Phase II. Because meaningful standards were obtained for the three jobs in Phase I, we attempted in Phase II to refine the standard setting methods to yield better agreement among the judges and greater convergence across methods. The standard

Table 1.5

Methods of Judging Implied Percent of Soldiers Performing at Each Level

MOS	Performance Dimension	Method	N	Percent Unacceptable Mean	Percent Unacceptable SD	Percent Outstanding Mean	Percent Outstanding SD
11B	General Soldiering	Soldier	80	8.0	5.3	12.4	9.6
		Task	81	21.0	14.9	7.7	9.4
		Incident	80	6.3	13.3	11.6	15.0
63B	General Soldiering	Soldier	49	8.4	6.9	16.3	18.6
		Task	50	23.0	14.6	11.0	12.1
	Basic Maintenance	Soldier	49	12.6	12.8	11.0	10.5
		Task	50	6.0	7.4	34.4	20.8
		Incident	49	4.4	16.3	8.8	12.6
71L	General Soldiering	Soldier	47	10.7	10.5	10.7	9.7
		Task	51	18.9	12.6	11.9	11.6
	Typing	Soldier	47	8.1	5.5	12.0	13.8
		Task	51	35.7	15.6	7.3	7.6
		Incident	52	10.8	14.7	9.2	12.2
	Other Clerical	Soldier	47	10.3	13.0	10.8	14.4
		Task	50	35.7	18.7	8.0	7.9
		Incident	52	4.6	12.4	4.8	5.6

setting instruments used in Phase I (Soldier-Based, Task-Based, and Critical Incident-Based) were also used in Phase II. However, the Task-Based instrument was modified to incorporate three judgmental procedures. The Task-Hypothetical Soldier (Task-HS) method required SMEs to rate the acceptability of 10 hypothetical soldiers based on an examination of hands-on test data for those soldiers. The Task-Detailed Percent GO (Task-DPG) method was an extension of the Task-HS procedure and required raters to identify minimum percent GO scores for each performance level based on an examination of hands-on test data for the hypothetical soldiers. Finally, the Task-Abbreviated Percent GO (Task-APG) method asked raters to set percent GO cutoff scores without examining any data. For the basic standard setting instruments (Soldier-Based, Task-Based, and Critical Incident-Based) and the Task-Based formats (Task-HS, Task-DPG, and Task-APG), we examined the reliability and congruence of standards set by different types of judges (NCO vs. Officer, FORSCOM vs. TRADOC) and the effects of a group discussion on standards.

In keeping with the goal to attempt to set standards on components of the job, standards were set on job dimensions as defined by the Hybrid job descriptor instrument. Depending on the standard setting instrument used, SMEs set standards on as many as seven dimensions (Soldier-Based) or as few as two dimensions (Task-Based). For each standard setting procedure, Table 1.6 presents the average percentage of soldiers performing at the Unacceptable and Outstanding levels across all applicable dimensions for each MOS. As in Phase I, the Task-Based formats resulted in the most stringent standards although there was a good deal of variability in their judgments among judges in setting standards.

While performance on some dimensions appears to be more influential than performance on other dimensions, the linear compensatory model aggregation strategy used by SMEs in Phase I was replicated in Phase II.

Phase III Objectives

Job description. Having identified the Task Category model as the prototypical job descriptor instrument, the primary job description goals of Phase III were to collect data on a broader array of MOS than had been sampled in the earlier phases and to more fully investigate various methods for creating predictor equations. Additional MOS included: 12B (Combat Engineer), 13B (Cannon Crewman), 27E (TOW/Dragon Repairer), 29E (Radio Repairer), 31C (Single Channel Radio Operator), 51B (Carpentry and Masonry Specialist), 54B (Chemical Operations Specialist), 55B (Ammunition Specialist), 95B (Military Police), 96B (Intelligence Analyst) from Project A, and 31D (Mobile Subscriber Equipment Transmission System Operator), a new MOS not included in Project A. Supplementary goals were (a) to replicate previous reliability examinations with a more thorough investigation of differences among the rank (NCO, Officer, and Civilian) and

Table 1.6

Methods of Judging Implied Percent of Soldiers Performing at Each Level

MOS	Performance Dimension[a]	Method	N	Percent Unacceptable Mean	Percent Unacceptable SD	Percent Outstanding Mean	Percent Outstanding SD
16S	2, 3, 7, 8, 11, 15, 18	Soldier	563	15.0	16.0	17.0	19.0
	2, 3, 7, 11, 15, 18	Incident	426	29.0	18.0	16.0	18.0
	2, 15, 18	Task-HS	209	38.0	25.0	6.0	8.0
	2, 15, 18	Task-OPG	180	44.0	17.0	6.0	6.0
	2, 15	Task-APG	41	39.0	17.0	8.0	9.0
19K	2, 3, 7, 8 11, 15, 18	Soldier	578	9.0	9.0	9.0	11.0
	2, 8, 15, 18	Incident	212	24.0	15.0	23.0	19.0
	2, 8, 15, 18	Task-HS	148	40.0	26.0	11.0	17.0
	2, 8, 15, 18	Task-DPG	121	42.0	25.0	13.0	17.0
	2, 8, 15, 18	Task-APG	56	53.0	21.0	7.0	7.0
67N	7, 8, 13, 15	Soldier	162	13.0	13.0	12.0	10.0
	8, 13, 17	Incident	156	17.0	13.0	16.0	14.0
	8, 15, 17	Task-HS	67	31.0	17.0	13.0	8.0
	8, 13, 17	Task-DPG	62	30.0	11.0	14.0	10.0
	8, 17	Task-APG	31	39.0	13.0	15.0	14.0
76Y	10, 11, 16, 17, 19	Soldier	235	21.0	21.0	16.0	19.0
	10, 16, 17, 19	Incident	200	18.0	13.0	17.0	17.0
	16, 17, 19	Task-HS	75	32.0	18.0	8.0	8.0
	16, 17, 19	Task-DPG	71	35.0	15.0	9.0	10.0
	16, 19	Task-APG	44	41.0	21.0	14.0	19.0
88M	4, 8, 11, 15 17	Soldier	250	16.0	15.0	14.0	13.0
	4, 8, 15, 17	Incident	208	20.0	14.0	15.0	16.0
	4, 8, 15, 17	Task-HS	102	22.0	17.0	13.0	11.0
	4, 8, 15, 17	Task-DPG	95	33.0	15.0	13.0	12.0
	4, 8, 15, 17	Task APG	74	44.0	14.0	9.0	6.0

(table continues)

Table 1.6 (continued)

MOS	Performance Dimension[a]	Method	N	Percent Unacceptable Mean	Percent Unacceptable SD	Percent Outstanding Mean	Percent Outstanding SD
91A	5, 17, 18, 19 22, 24	Soldier	342	21.0	15.0	18.0	13.0
	5, 18, 19, 22	Incident	228	22.0	16.0	22.0	21.0
	8, 17, 18, 19 22	Task-HS	146	35.0	25.0	7.0	8.0
	5, 17, 18, 19 22	Task-DPG	134	40.0	21.0	8.0	7.0
	5, 17, 18, 18 22	Task-APG	109	41.0	18.0	8.0	8.0
94B	11, 13, 23	Soldier	129	14.0	12.0	11.0	10.0
	11, 13	Incident	88	26.0	20.0	20.0	18.0

Note. 94B SMEs were not administered any of the Task-Based protocols because MOS-specific hands-on data is not available for the dimensions appropriate for this MOS.

[a]Performance Dimensions are as follows:

2 = Crew-Served Weapons
3 = Tactical Movements
4 = Navigate
5 = First Aid
7 = Detect Targets
8 = Repair Mechanical Systems
10 = Use Technical References
11 = Pack and Load
13 = Operate/Install
15 = Operate Vehicles
16 = Type
17 = Record Keeping
18 = Oral Communication
19 = Written Communication
22 = Medical Treatment
23 = Food Preparation
24 = Leadership

command (TRADOC vs. operational units) rater groups and (b) to replicate examination of the convergence among Task Questionnaire rating scales.

Standard setting. Goals for standard setting included refining both the Behavioral Incident and Task-Based questionnaires based on Phase II results. The changes were intended to simplify data collection procedures and to increase reliability. Instruments were also altered such that standard setting dimensions were derived from the Task Questionnaire, rather than the abandoned Hybrid Questionnaire. The revised instruments required (a) assessments of reliability within and across rater groups, (b) examination of the generalizability of standards across dimensions, and (c) examination of the

differences among MOS in standards. In addition, Phase III standard setting attempted the linkage of performance standards to selection standards.

Summary

The Synthetic Validity Project is attempting to develop methods for addressing two of the Army's most critical personnel management problems: (a) What information should be used to select and classify people into an MOS when empirical validation data are not available? and (b) How should selection standards be set so as to optimize the Army's goals and promote fairness and equity for all applicants? The investigation of both synthetic validation and standard setting proceeded through three iterative phases. Each phase considered additional measurement issues and expanded the sample of jobs. The remainder of this report will discuss, in detail, the results of Phase III, highlighting how those results compare with Phases I and II. Based on the evaluations conducted as part of this project, recommendations will be made for further research and for the "method of choice" if either synthetic validation or standard setting were to be carried out tomorrow.

Chapter 2: Method and Procedures

Cynthia K. Owens-Kurtz and Janis S. Houston (PDRII)

Phase III data collection workshops were conducted from the end of January to mid-May 1990 at 10 Army installations throughout the United States. These workshops were four hours in length and ranged in size from 3 to 18 participants, with an average group size of approximately 11. Separate workshops were held for NCOs and Officers in most cases, with Civilians attending whichever session was most appropriate. Except in rare instances, workshops were held separately by MOS.

Description of Sample

General Description of Sample

During Army Project A, the jobs studied were divided into two subsets, referred to as "Batch A" and "Batch Z" MOS. For Batch A MOS, Task-Based tests and job-specific rating scales were developed. These measures provided useful input to the Synthetic Validity Project research instruments as described in earlier reports (Peterson, Owens-Kurtz, Hoffman, Arabian, & Whetzel, 1990; Wise, Arabian, Chia, & Szenas, 1989.) For Batch Z MOS, job-specific performance measures were limited to school-based knowledge tests.

In the Synthetic Validity Phase III workshops, 11 MOS were studied. Three of these were Project A Batch A MOS:

- 13B Cannon Crewman,
- 31C Single Channel Radio Operator, and
- 95B Military Police.

Of the remaining MOS studied, seven were Project A Batch Z MOS:

- 12B Combat Engineer,
- 27E TOW/Dragon Repairer,
- 29E Radio Repairer,
- 51B Carpentry and Masonry Specialist,
- 54B Chemical Operations Specialist,
- 55B Ammunition Specialist, and
- 96B Intelligence Analyst.

Two of these MOS, 29E and 96B, were added to Project A after the 1985 Concurrent Validation (CV) data collection. Thus, we excluded 29E and 96B from analyses that relied on CV data (see Chapter 4).

One new MOS, 31D Mobile Subscriber Equipment Transmission System Operator, was recently added to the Army enlisted MOS and was, therefore, not part of Project A. Because 31D has no "history," it will serve as a test of the accuracy and completeness of the research instruments and procedures for MOS outside Project A and for new MOS.

Two populations of judges participated in the Phase III data collection. The first included NCOs, Officers, and Civilians at TRADOC sites who help define doctrine and prepare training plans for each MOS. The second included NCOs and Officers at FORSCOM sites who supervise or have responsibility for first-term soldiers in these MOS.

The six TRADOC data collection sites were:

- Ft. McClellan (54B, 95B),
- Ft. Sill (13B),
- Ft. Leonard Wood (12B, 51B),
- Ft. Gordon (29E, 31C, 31D),
- Ft. Huachuca (96B), and
- Redstone Arsenal (27E, 55B).

The four FORSCOM sites were:

- Ft. Bragg (27E, 29E, 54B, 55B, 96B),
- Ft. Riley (27E, 29E, 51B, 55B, 96B),
- Ft. Campbell (12B, 13B, 31C, 54B, 95B), and
- Ft. Shafter[1] (12B, 13B, 31C, 51B, 95B).

Note that 31D workshop participants were available only at Ft. Gordon, a TRADOC site.

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[1]Ft. Shafter is technically a WESTCOM site. Throughout this report it is treated as a FORSCOM site because it is an operational TO&E unit.

Sample Sizes by MOS, Rank, and Command

A total of 930 personnel were requested for the Phase III data collection. Of this number, 687 (74%) participated. Table 2.1 presents the sample sizes requested and received by MOS and site for TRADOC sites. Table 2.2 presents the sample sizes for FORSCOM sites. Some of the MOS studied are very low density at the sites available, and some personnel were unavailable due to world events. (A number of personnel in several of our target MOS were in Panama during our data collection.) Included in Tables 2.1 and 2.2 are the number of participants we expected at each site, based on estimates from our on-site points of contact (POC) prior to the data collection. We received 687 of a projected 739 participants, or 92%.

Table 2.3 presents the total number of participants for each MOS by rank and command. The mean total sample size for the 10 MOS studied at both TRADOC and FORSCOM sites (excluding 31D) is 67, with a range of 34 to 81. Seventeen individuals participated in the 31D workshops.

Demographics of Sample

Tables 2.4 to 2.7 display the demographics of workshop participants, separately for each MOS. The variables included in these tables are race, gender, pay grade, and military and MOS experience.

Table 2.4 presents the racial distribution of the judges. The participants were primarily White (67%) or African-American (25%). The majority of participants (89%) were male as shown in Table 2.5.

The pay grade by MOS breakdown appears in Table 2.5. Although we initially requested only soldiers in pay grades E6 to E9 for NCO participants, and O2 to O4 for Officers, we reduced this constraint when we learned how few NCOs and Officers at this level were available at some sites. We were assured by the POCs that all personnel in grades lower than E6 or O2 that were tasked to attend the workshops were very knowledgeable in the target MOS.

The Army and MOS-specific experience of the workshop participants are presented in Table 2.7. Because 31D is a relatively new MOS, the median MOS experience for 31D judges was low (1.0 years). Overall, median Army experience was 9.8 years, and median MOS experience was 6.3 years. We grouped the participants into four MOS experience groups: 0 to 1 year, 1 year and 1 month to 3 years, 3 years and 1 month to 6 years, and greater than 6 years. The cross-tabulation of these groups by MOS appears in Table 2.8. For each MOS experience category, the median Army experience (in years) across MOS is also presented in Table 2.8.

Table 2.1

Phase III Sample: Numbers Requested, Expected, and Received at TRADOC Sites by MOS and Rank

MOS	NCO			OFF/CIV			TOTAL			% of	% of
	Rqstd.	Exp'd.	Rec'd.	Rqstd.	Exp'd.	Rec'd.	Rqstd.	Exp'd.	Rec'd.	Rqstd.	Exp'd.
Ft. McClellan, 6 February 1990											
54B	15	15	14	15	15	15	30	30	29	97%	97%
95B	15	15	15	15	15	11[a]	30	30	26	87%	87%
Totals	30	30	29	30	30	26	60	60	55	92%	92%
Ft. Sill, 12 February 1990											
13B	15	15	8[b]	15	15	12	30	30	20	67%	67%
Ft. Leonard Wood, 13-14 March 1990											
12B	15	15	12	15	15	15	30	30	27	90%	90%
51B	15	15	12	15	15	17	30	30	29	97%	97%
Totals	30	30	24	30	30	32	60	60	56	93%	93%
Ft. Gordon, 27-28 March 1990											
29E	15	15	12	15	10	5	30	25	17	57%	68%
31C	15	15	15	15	11	13	30	26	28	93%	100+%
31D	15	15	15	15	0	2	30	15	17	57%	100+%
Totals	45	45	42	45	21	20	90	66	62	69%	94%

(table continues)

Table 2.1 (continued)

MOS	NCO Rqstd.	NCO Exp'd.	NCO Rec'd.	OFF/CIV Rqstd.	OFF/CIV Exp'd.	OFF/CIV Rec'd.	TOTAL Rqstd.	TOTAL Exp'd.	TOTAL Rec'd.	% of Rqstd.	% of Exp'd.
Ft. Huachuca, 27-28 March 1990											
96B	15	15	18	15	10	5	30	25	23	77%	92%
Redstone Arsenal, 10-11 April 1990											
27E	15	15	13	15	4	3	30	19	16	53%	84%
55B	15	12	13	15	11	11	30	23	24	80%	100+%
Totals	30	27	26	30	15	14	60	42	40	67%	95%
Total TRADOC											
Total	165	162	147	165	121	109	330	283	256	78%	90%

[a]Received 15 Officers, but 4 were not used because they were not sufficiently familiar with 95B. [b]Received 10 NCO, but 2 were not used because they were not sufficiently familiar with 13B.

Table 2.2

Phase III Sample: Numbers Requested, Expected, and Received at FORSCOM Sites by MOS and Rank

MOS	NCO			OFF/CIV			TOTAL			% of	% of
	Rqstd.	Exp'd.	Rec'd.	Rqstd.	Exp'd.	Rec'd.	Rqstd.	Exp'd.	Rec'd.	Rqstd.	Exp'd.
Ft. Bragg, 30 January - 1 February 1990[a]											
27E	15	12	9	15	3	2	30	15	11	37%	73%
29E	15	15	20	15	5	2	30	20	22	73%	100+%
54B	15	15	14	15	10	9	30	25	23	77%	92%
55B	15	15	16	15	5	1	30	20	17	57%	85%
96B	15	0	14	15	0	5	30	0	19	63%	100+%
Totals	75	57	73	75	23	19	150	80	92	61%	100+%
Ft. Riley, 20-22 March 1990											
27E	15	7	6	15	4	1	30	11	7	23%	64%
29E	15	11	8	15	4	4	30	15	12	40%	80%
51B	15	15	16	15	4[b]	11[b]	30	19	27	90%	100+%
55B	15	15	15	15	6	7	30	21	22	73%	100+%
96B	15	15	13	15	12	8	30	27	21	70%	78%
Totals	75	63	58	75	30	31	150	93	89	59%	96%

(table continues)

Table 2.2 (continued)

MOS	NCO Rqstd.	NCO Exp'd.	NCO Rec'd.	OFF/CIV Rqstd.	OFF/CIV Exp'd.	OFF/CIV Rec'd.	TOTAL Rqstd.	TOTAL Exp'd.	TOTAL Rec'd.	% of Rqstd.	% of Exp'd.
Ft. Campbell, 1-4 May 1990											
12B	15	15	14	15	15	13	30	30	27	90%	90%
13B	15	15	14	15	13	12	30	28	26	87%	93%
31C	15	15	12	15	15	10	30	30	22	73%	73%
54B	15	15	13	15	15	7	30	30	20	67%	67%
95B	15	15	15	15	13	12	30	28	27	90%	96%
Totals	75	75	68	75	71	54	150	146	122	81%	84%
Ft. Shafter, 22-24 May 1990											
12B	15	15	17	15	11	10	30	26	27	90%	100+%
13B	15	15	15	15	15	12	30	30	27	90%	90%
31C	15	15	15	15	10	12	30	25	27	90%	100+%
51B	15	15	14	15	15	10	30	30	24	80%	80%
95B	15	15	14	15	11	9	30	26	23	77%	88%
Totals	75	75	75	75	62	53	150	137	128	85%	93%
Total FORSCOM											
Total	300	270	274	300	186	157	600	456	431	72%	95%

[a]We originally requested 95B also, but due to the situation in Panama the request was denied.
[b]Only 4 Officers supervised 51B at this site. We received additional Officers who had prior experience supervising 51B or had worked with but never supervised 51B.

Table 2.3

Phase III Sample: MOS by Command by Rank

MOS	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM Total	TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC Total	TOTAL NCO	TOTAL OFF	TOTAL CIV	TOTAL Total
12B	31	23	0	54	12	13	2	27	43	36	2	81
13B	29	24	0	53	8	6	6	20	37	30	6	73
27E	15	3	0	18	13	0	3	16	28	3	3	34
29E	28	6	0	34	12	2	3	17	40	8	3	51
31C	27	22	0	49	15	12	1	28	42	34	1	77
31D	0	0	0	0	15	1	1	17	15	1	1	17
51B	30	21	0	51	12	11	6	29	42	32	6	80
54B	27	16	0	43	14	13	2	29	41	29	2	72
55B	31	8	0	39	13	5	6	24	44	13	6	63
95B	29	21	0	50	15	11	0	26	44	32	0	76
96B	27	12	1	40	18	0	5	23	45	12	6	63
TOTAL	274	156	1	431	147	74	35	256	421	230	36	687

Table 2.4

Phase III Sample Demographics: Race

MOS	Black/African-American	American Indian	Hispanic	White	Other	Blank	TOTAL
12B	10	1	2	66	2	0	81
13B	10	0	5	55	3	0	73
27E	8	0	4	21	1	0	34
29E	12	0	1	37	1	0	51
31C	37	0	5	33	2	0	77
31D	9	0	0	6	1	1	17
51B	15	0	4	57	4	0	80
54B	19	0	3	48	1	1	72
55B	27	0	3	33	0	0	63
95B	10	2	2	60	2	0	76
96B	13	1	4	45	0	0	63
TOTAL	170	4	33	461	17	2	687
PERCENT	25%	<1%	5%	67%	2%	<1%	

Table 2.5

Phase III Sample Demographics: Gender

MOS	Male	Female	Unknown	TOTAL
12B	80	1	0	81
13B	72	1	0	73
27E	32	2	0	34
29E	47	4	0	51
31C	61	15	1	77
31D	13	4	0	17
51B	73	7	0	80
54B	67	3	2	72
55B	56	7	0	63
95B	63	13	0	76
96B	46	17	0	63
TOTAL	610	74	3	687
PERCENT	89%	11%	<1%	

Table 2.6

Phase III Sample Demographics: Pay Grade

	Pay Grade									
MOS	E3	E4	E5	E6-E9	W1-W3	01	02-04	GS9-GS12	Unknown	TOTAL
12B	0	3	12	28	0	8	28	2	0	81
13B	0	0	4	33	0	1	29	5	1	73
27E	0	0	11	17	1	1	1	3	0	34
29E	2	5	18	15	1	2	5	3	0	51
31C	0	1	14	27	0	7	27	1	0	77
31D	0	9	5	1	0	1	0	1	0	17
51B	0	3	10	29	0	9	23	6	0	80
54B	0	0	8	32	0	2	26	2	2	72
55B	0	0	25	19	5	3	5	6	0	63
95B	0	0	2	42	0	4	28	0	0	76
96B	2	1	20	22	4	1	7	6	0	63
TOTAL	4	22	129	265	11	39	179	35	3	687
PERCENT	<1%	3%	19%	39%	2%	6%	26%	5%	<1%	

Note. Percentages sum to >100 due to rounding.

Table 2.7

Phase III Sample Demographics: Total Army and MOS Experience in Years

MOS	Army Experience				MOS Experience			
	N	Mdn	MIN	MAX	N	Mdn	MIN	MAX
12B	80	7.8	0.8	25.0	81	5.3	0.1	25.0
13B	72	11.9	2.0	40.0	71	8.9	0.0	29.2
27E	34	11.8	2.4	37.8	34	9.1	0.1	15.0
29E	51	8.6	1.1	25.1	51	4.3	0.0	19.3
31C	76	8.8	1.0	30.3	75	6.0	0.0	23.0
31D	17	6.7	3.0	29.3	17	1.0	0.3	2.2
51B	80	10.1	0.8	30.3	80	5.0	0.0	30.0
54B	71	10.6	1.3	32.8	71	6.2	0.8	12.0
55B	63	10.0	1.3	35.0	63	6.3	0.8	35.0
95B	76	11.5	0.5	22.6	76	10.2	0.5	22.6
96B	63	10.1	0.8	32.3	62	5.1	0.3	20.0
Overall	683	9.8	0.5	40.0	681	6.3	0.0	35.0

Table 2.8

MOS Experience Categories Frequencies by MOS

MOS	MOS Experience Category 0-1 Year	>1-3 Years	>3-6 Years	>6 Years	Unknown	TOTAL
12B	8	14	22	37	0	81
13B	3	12	10	46	2	73
27E	2	2	3	27	0	34
29E	9	11	14	17	0	51
31C	12	13	15	35	2	77
31D	11	6	0	0	0	17
51B	14	19	11	36	0	80
54B	1	11	23	36	1	72
55B	4	6	19	34	0	63
95B	3	3	11	59	0	76
96B	5	14	18	25	1	63
TOTAL	72	111	146	352	6	687
Army Experience: Mdn	4.1	4.0	6.9[a]	13.4[a]	6.6[b]	

[a]One case excluded from median due to missing Army experience data.
[b]Two cases excluded from median due to missing Army experience data.

Workshop Procedures and Instruments

Overview of Workshop Procedures

At the beginning of each four hour workshop, participants were provided with an overview of the Synthetic Validation Project and briefed on the schedule of the day's activities. A Privacy Act statement was distributed and read, and a Background Information sheet was completed by each participant. Participants were given an opportunity to ask questions about the project and the workshop.

Participants then completed a job description instrument, the Army Task Questionnaire. Next, two standard setting exercises were administered: the Behavioral Incident Standard Setting Questionnaire and the Task-Based Standard Setting Form. The order of administration of the standard setting exercises was varied across workshops. Finally, participants completed an instrument designed to assess the complexity of MOS tasks, the Task Complexity Questionnaire.

Brief descriptions and samples of these instruments/ exercises appear below. A detailed description of each instrument appears in the relevant chapter of this report. Appendix A contains a copy of all workshop instruments and instructions for a single MOS, 12B, and Volume II of this report contains all instruments for all MOS.

Army Task Questionnaire

The Army Task Questionnaire contained 96 task categories and required participants to make five ratings for each: Frequency, Importance for Core Technical Proficiency,[2] Importance for General Soldiering Proficiency,[3] Importance for Overall Job Performance,[4] and Difficulty.[5] (See Figure 2.1 for the instructions and example.) First, the relative frequency of each of the 96 tasks was rated. After completing the Frequency

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[2]Core Technical Proficiency is made up of the tasks that are "central" to the MOS. The tasks represent the core of the job and are the primary definers of the MOS.

[3]Individuals in every MOS are responsible for being able to perform a variety of general soldiering tasks. These are referred to as "Common Tasks." General Soldiering Proficiency refers to all Common Tasks.

[4]Overall Job Performance refers to all areas of job performance, including Core Technical and General Soldiering Proficiency. This is total job performance.

[5]Difficulty refers to how difficult it is to reach and maintain an acceptable level of proficiency in the task.

ratings for all 96 task categories, participants made the three Importance ratings and the Difficulty rating for all tasks with a Frequency rating greater than 0. When making their ratings, participants were instructed to consider soldiers with 24 months of service in the target MOS after Basic and Advanced Individual Training (AIT) and to consider the full range of duty assignments for the target MOS. After ratings were completed for the 96 tasks, participants were asked to indicate the percentage of the target MOS covered by the task categories. Finally, participants were asked to list any task categories that should be added to the questionnaire. Most participants completed this questionnaire within 60 minutes. The Army Task Questionnaire is described in detail in Chapter 3 of this report; a copy of the entire instrument appears in Appendix A.

Standard Setting Exercises

Two standard setting exercises were conducted. The order of their administration, shown in Table 2.9, varied across workshops. In some instances, such as individuals arriving late or make-up sessions, the administration order differed from Table 2.9. In all cases, the standard setting exercises were administered after the Army Task Questionnaire.

In both exercises, participants were asked to set standards for two or three task areas relevant to the target MOS. Figure 2.2 defines each task area and Table 2.10 shows the task areas rated by each MOS. The following performance level definitions were used to set the standards:

- Unacceptable: Soldiers who **consistently** perform like this should not have been selected for this MOS. Their performance is hurting the Army. Additional training would not bring their performance up to acceptable levels.

- Marginal: Soldiers who **consistently** perform like this need extra or remedial training. Their current performance is of little or no benefit to the Army.

- Acceptable: Soldiers who **consistently** perform like this are doing an adequate job. They are making positive contributions to the Army.

- Outstanding: Soldiers who **consistently** perform like this are doing extremely well. They are making exceptional contributions to the Army and are good examples to other soldiers.

ARMY TASK QUESTIONNAIRE

This questionnaire contains 96 tasks designed to cover ALL ENTRY-LEVEL MOS in the Army. Since it is designed to cover so many MOS, a large number of these tasks may not apply to the particular MOS you are rating.

For each task, we would like you to make five ratings. First, indicate how FREQUENTLY each task is performed by soldiers in this MOS, using the following FREQUENCY rating scale:

0 = Never; this task is not part of the job.
1 = Least Often; this task is performed much less often than most other tasks.
2 = Not Very Often; this task is performed less often than most other tasks.
3 = Often; this task is performed about as often as other tasks.
4 = Very Often; this task is performed more often than most other tasks.
5 = Most Often; this task is performed much more often than most other tasks.

As you make your ratings, think about soldiers who have about 24 months of service in this MOS after Basic and AIT. Also keep in mind all that you know about the full range of duty assignments for this MOS.

After you have made **FREQUENCY** ratings for all 96 tasks, go through the list again, this time rating the **IMPORTANCE** of each task for successful performance in three different areas of the job: Core Technical Area, General Soldiering Area, and Overall Performance. The definitions of these performance areas are on a separate sheet, entitled PERFORMANCE AREA DEFINITIONS. Please read these definitions carefully before making your **IMPORTANCE** ratings.

You will make **IMPORTANCE** ratings *using the following rating scale:*

0 = No Importance
1 = Extremely Low Importance
2 = Low Importance
3 = Moderate Importance
4 = High Importance
5 = Extremely High Importance

In addition to the **IMPORTANCE** ratings, we would like you to make a single **DIFFICULTY** rating for each task, using the following scale:

How difficult is it to *reach* and maintain an acceptable level of proficiency in this task?

1 = *Very Easy;* this task can be *performed correctly after* less than an hour of instruction, and performed again correctly a year later with little or no practice in between.
2 = Somewhat Easy
3 = Neither Easy Nor Difficult; this task can be performed correctly after a few days of instruction, and performed again correctly a few months later with little or no practice in between.
4 = Somewhat Difficult
5 = Very Difficult; this task can be *performed correctly after several* weeks of instruction, and performed again correctly only if it is practiced regularly.

Note: If you decided that a particular task is not part of this MOS (so you gave it a **FREQUENCY** rating of 0), you should leave all three **IMPORTANCE** ratings and the **DIFFICULTY** rating blank.

Figure 2.1. Instructions and example from the Army Task Questionnaire.

Please look at the EXAMPLES below and read through their explanations before starting to make your ratings.

EXAMPLES:

FREQUENCY	IMPORTANCE	DIFFICULTY
0 = Never 1 = Least Often 2 = Not Very Often 3 = Often 4 = Very Often 5 = Most Often	0 = No Importance 1 = Extremely Low Importance 2 = Low Importance 3 = Moderate Importance 4 = High Importance 5 = Extremely High Importance	1 = Very Easy 2 = Somewhat Easy 3 = Neither Easy Nor Difficult 4 = Somewhat Difficult 5 = Very Difficult

	Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
A.	0	***Perform Medical Laboratory Procedures***: Conduct various types of blood tests, urinalysis, cultures, etc.				
B.	1	***Perform Operator Checks and Services on Weapons***: Check, disassemble, assemble, clean, lubricate, and adjust weapons, including pistols, rifles, machine guns, hand grenades, and breechblocks.	2	4	4	4

Joe supervises 94B (Cooks). He went through the list of tasks and made **FREQUENCY** ratings for each one.

1. Since he felt that Task A, "Perform Medical Laboratory Procedures," was not part of the job for 94B, he gave this task a FREQUENCY rating of 0, and left all three IMPORTANCE ratings and the DIFFICULTY rating blank.

2. Joe felt that Task B, "Perform Operator Checks and Services on Weapons," was performed much less often than most tasks in MOS 94B, so he gave it a FREQUENCY rating of 1, for Least Often.

Joe then returned to the beginning of the list and, after carefully reading the PERFORMANCE AREA DEFINITIONS, has started making his ratings of how **IMPORTANT** each task is for successful performance in three different areas of the job.

Joe decided that this task was of Low Importance for Core Technical Area, so he gave it an IMPORTANCE rating of 2.

For General Soldiering, Joe felt that this task was of High Importance, so he gave it an IMPORTANCE rating of 4 for this performance area.

For Overall Performance, Joe gave this task a rating of 4, indicating the task was of High Importance for overall job performance.

Finally, Joe gave Task B a **DIFFICULTY** rating of 4, indicating that it is somewhat Difficult for most soldiers to reach and maintain an acceptable level of proficiency on this task.

Keep the PERFORMANCE AREA DEFINITIONS handy and refer to them as often as necessary while making your **IMPORTANCE** ratings.

Note: Many of the task definitions in this questionnaire contain specific examples to help explain and clarify the task. Please keep in mind that these are just some of the possible examples; it was not practical to list every possible example.

Figure 2.1. Instructions and example from the Army Task Questionnaire (continued).

Table 2.9

Phase III Administration Order of Standard Setting Exercises

MOS	Site	Rank	Order	MOS	Site	Rank	Order
12B	Campbell (F)	NCO	BI, TB	51B	Riley (F)	NCO	BI, TB
		Officers	TB, BI			Officers	TB, BI
	Leonard Wood (T)	NCO	TB, BI		Leonard Wood (T)	NCO	TB, BI
		Officers	BI, TB			Officers	BI, TB
	Shafter (F)	NCO	BI, TB		Shafter (F)	NCO	BI, TB
		Officers	TB, BI			Officers	TB, BI
13B	Campbell (F)	NCO	TB, BI	54B	Bragg (F)	NCO	TB, BI
		Officers	BI, TB			Officers	BI, TB
	Sill (T)	NCO	BI, TB		McClellan (T)	NCO	BI, TB
		Officers	TB, BI			Officers	TB, BI
	Shafter (F)	NCO	TB, BI		Campbell (F)	NCO	TB, BI
		Officers	BI, TB			Officers	BI, TB
27E	Bragg (F)	NCO	BI, TB	55B	Bragg (F)	NCO	BI, TB
		Officers	TB, BI			Officers	TB, BI
	Redstone Arsenal (T)	NCO	BI, TB		Redstone Arsenal (T)	NCO	TB, BI
		Officers	TB, BI			Officers	BI, TB
	Riley (F)	NCO	TB, BI		Riley (F)	NCO	BI, TB
		Officers	BI, TB			Officers	TB, BI

(table continues)

Table 2.9 (continued)

MOS	Site	Rank	Order	MOS	Site	Rank	Order
29E	Bragg (F)	NCO	BI, TB	95B	Campbell (F)	NCO	TB, BI
		Officers	TB, BI			Officers	BI, TB
	Gordon (T)	NCO	BI, TB		McClellan (T)	NCO	BI, TB
		Officers	TB, BI			Officers	TB, BI
	Riley (F)	NCO	TB, BI		Shafter (F)	NCO	TB, BI
		Officers	BI, TB			Officers	BI, TB
31C	Campbell (F)	NCO	BI, TB	96B	Bragg (F)	NCO	TB, BI
		Officers	TB, BI			Officers	TB, BI
	Gordon (T)	NCO	TB, BI		Huachuca (T)	NCO	TB, BI
		Officers	BI, TB			Officers	BI, TB
	Shafter (F)	NCO	BI, TB		Riley (F)	NCO	BI, TB
		Officers	TB, BI			Officers	TB, BI
31D	Gordon (T)	NCO	BI, TB				
		Officers	TB, BI				

Note. F = FORSCOM; T = TRADOC; BI = Behavioral Incident Instrument; TB = Task-Based Instrument.

B. Electrical and Electronic Systems Maintenance:

Inspect, install, maintain, or repair electrical or electronic equipment.

D. Vehicle and Equipment Operations:

Drive or operate heavy mechanical equipment.

H. Clerical:

Type; follow standard procedures to complete forms, copy, file, and retrieve information; distribute, inspect, store, and ship materials.

I. Communication:

Give and receive information using oral, written, and hand/arm signals. Read manuals, publications, maps, etc. Provide counseling.

M. Individual Combat:

Engage in combat and survival skills; know customs and laws of war.

N. Crew-served Weapons:

Operate and fire direct and indirect crew-served weapons.

Figure 2.2. Definitions of task areas used in standard setting exercises.

Table 2.10

Task Areas Used for Standard Setting Exercises for Each MOS

MOS	B	D	H	I	M	N
12B		X			X	
13B		X			X	X
27E	X		X		X	
29E	X			X	X	
31C	X			X	X	
31D	X			X	X	
51B		X			X	
54B		X			X	
55B		X	X		X	
95B			X	X	X	
96B			X	X	X	

Behavioral Incident Standard Setting Questionnaire. In the Behavioral Incident Standard Setting Questionnaire, participants were provided with 20 behavioral incidents in each of the two or three task areas relevant to the target MOS. (See Figure 2.3 for the instructions and example.) The incidents came from several MOS and were sampled to ensure coverage of the task areas and levels of performance. For incidents involving tasks not performed in the target MOS, participants were instructed to think of similar tasks performed in the target MOS. Participants rated each incident as indicative of Unacceptable, Marginal, Acceptable, or Outstanding performance. A "Cannot Rate" option was also provided. Most participants completed this questionnaire within 30 minutes. The Behavioral Incident Standard Setting Questionnaire is described in detail in Chapter 5 of this report, and a full copy of it appears in Appendix A.

Task-Based Standard Setting Form. The Task-Based Standard Setting Form provided three sample tasks for each of the two or three task areas relevant to the target MOS. (See Figure 2.4 for the instructions and example.) Participants decided as a group

Name:________________________

Behavioral Incident Standard Setting Questionnaire

12B - COMBAT ENGINEER

In this section of the workshop we would like you to help us set job performance standards on two or three broad performance areas that apply to the MOS that you are rating. For each area, twenty behavioral incidents, or examples of performance, have been provided by other SMEs as samples of the types of behaviors that fit each area. These examples come from a number of different MOS and they vary in level of effectiveness. Thus, some incidents illustrate poor performance and some illustrate good performance, but they all illustrate performance within a particular type of job behavior.

For each area, read the definition and think of similar types of tasks that are performed in the MOS that you are rating. Then for each behavioral incident ask yourself the following question:

> If a soldier CONSISTENTLY performed duties in this area at a level of effectiveness like the example incident, what kind of soldier would this be?

Refer to the one-page handout containing the definitions of Unacceptable, Marginal, Acceptable, and Outstanding performance to guide you as you make your ratings. Make your ratings by thinking of similar types of incidents for your MOS. Circle the letter that matches that level of effectiveness of incident. If any incident is so unfamiliar that you cannot decide what level of performance effectiveness it represents, than circle CNR for "cannot rate." Please make sure that you circle only one response for each example.

Remember: As you make your ratings, think about soldiers who have about 24 months of service in this MOS after Basic and AIT. Also keep in mind all that you know about the full range of duty assignments for this MOS.

Example:

Demonstrate Leadership -- Demonstrate leadership and maturity. Act as a model; give direction and instruction to peers; support peers and/or provide informal counseling; and promote a positive public image of the military.

1. This soldier spent many duty and non-duty hours learning his new MOS. In a few months, he was tops in his MOS and was selected as the first E-4 to evaluate other soldiers in the MOS. U M A O CNR

The rater read the definition of Demonstrate Leadership and the example and decided that a soldier who consistently performed like this example would be demonstrating outstanding leadership. Therefore, the rater circled the "O" for Outstanding.

Figure 2.3. Instructions and example from the Behavioral Incident Standard Setting Questionnaire.

Task-Based Standard Setting Exercise
Instructions and EXAMPLE

In this exercise, we would like you to help us set standards for performance in two or three fairly general areas. These areas could apply to more than one MOS; some examples are Individual Combat, Vehicle and Equipment Operation, and Communication.

There are two major steps that will be completed for each task area. The first step involves group participation, while the second step is completed individually. Refer to the EXAMPLE on the next page as you *read through the steps below.*

Step 1. Read the Task Area Definition and the Sample Tasks listed there. Under the "Yes/No" column, circle "Y" if you think the Sample Task is performed in the MOS you are rating; circle "N" if you think it is <u>not</u> peformed in this MOS. If you circle "N," try to think of a task that is performed in this MOS that is <u>similar</u> to the Sample Task in terms of the type of operations or steps involved, the kinds of skills required, and the degree of difficulty in performing the task. However, do not write your "substitute" task down yet.

After everyone has completed this part of the step, we will discuss possible substitute tasks (or the group may decide that the Sample Task really does occur). After this discussion, a consensus will be reached about the best substitute tasks, and these will be written on the appropriate lines.

Look at the EXAMPLE. A group of 63B agreed that "Replace transmission rotor hub assembly" was not performed in their MOS, and they reached a consensus, after discussion, that "Replace hydrovac in a 5-Ton" was similar in terms of operations performed, skills required, and degree of difficulty in performing. The group <u>did</u> think the other two Sample Tasks were performed in the 63B MOS, so the "Y" is circled for those two tasks, and no substitutes appear.

Step 2. After agreeing on Sample Tasks or substitutes, you will individually complete the second major step, judging what should be the test score cutoffs on these tasks in order to be viewed as Marginal, Acceptable, or Outstanding performers (using the Performance Level Definitions).

To help make judgments for the second step, the form provides information about actual soldier performance on hands-on tests of the Sample Tasks. This test-score information is <u>not</u> based on SQT scores, where soldiers are allowed to practice repeatedly. The hands-on test scores referred to here are from specially-developed tests that were given with no advance warning and no practice allowed.

Look at the EXAMPLE again. In the EXAMPLE, 34 out of 100 soldiers score 55 or worse on the specially developed hands-on tests for these sample tasks. In other words, 34 out of 100 soldiers could correctly perform 55% or fewer of the steps in the hands-on tests.

The judge in this example decided that getting less than 55% correct on these tasks was Unacceptable and drew his line marking the Unacceptable category below 55. He felt that scores less than 75 were Marginal; 75 and above Acceptable. Finally, he felt that scores of 95 and better represent Outstanding performance. Nine out of 100 soldiers (100 minus 91) would be considered outstanding performers, according to this judge.

PLEASE put your name and the MOS you're rating in the spaces provided on <u>EVERY</u> page.

NOTE: As you make your ratings, think about soldiers who have about 24 months of service in this MOS after Basic and AIT. Also keep in mind all that you know about the full range of duty assignments for this MOS.

Figure 2.4. Instructions and example from the Task-Based Standard Setting Form.

EXAMPLE

Task-Based Standard Setting Form

A. Mechanical Systems Maintenance: Inspect, install, maintain, or repair mechanical systems.

Sample Tasks	Part of the MOS? YES/NO	Substitute Tasks
1. Perform operator maintenance on M16A1 rifle.	Y N	1.
2. Replace transmission in rotor hub assembly.	Y N	2. Replace hydrovac in a 5-Ton
3. Replace wheel bearings.	Y N	3.

Actual Hands-On Test-Score Information for these Tasks:

	Test Score % OF Steps Correctly Performed	Number of Soldiers Who Score the Same or Worse Than This
O	100	100 out of 100 soldiers
	95	91 out of 100 soldiers
A	90	82 out of 100 soldiers
	85	73 out of 100 soldiers
	80	63 out of 100 soldiers
	75	57 out of 100 soldiers
M	70	51 out of 100 soldiers
	65	47 out of 100 soldiers
	60	42 out of 100 soldiers
	55	34 out of 100 soldiers
U	50	26 out of 100 soldiers
	45	25 out of 100 soldiers
	40	24 out of 100 soldiers
	35	23 out of 100 soldiers
	30	21 out of 100 soldiers
	25	16 out of 100 soldiers
	20	11 out of 100 soldiers
	15	10 out of 100 soldiers
	10	9 out of 100 soldiers

DRAW 3 LINES THAT MARK THE CUTOFFS BETWEEN THE CATEGORIES.

LABEL THE CATEGORIES: O (Ouststanding)
A (Acceptable)
M (Marginal)
U (Unacceptable)

Figure 2.4. Instructions and example from the Task-Based Standard Setting Form (continued).

whether each sample task was relevant to the target MOS. If a task was irrelevant, the group suggested alternative tasks similar to the sample task in terms of the type of operations or steps involved, the kinds of skills required, and the degree of difficulty in performing the task. The group discussed the alternatives, then reached a consensus about the substitute task to use.

Actual hands-on test score information from Army Project A was presented on the form. This information was presented in two columns. In the first column, test scores at 5-point intervals were listed. The second column presented the number of soldiers (out of 100) who scored at or below the adjacent test score based on Project A data. Participants were instructed to draw three lines to mark the cutoffs between the four performance levels and to label the categories O for Outstanding, A for Acceptable, M for Marginal, and U for Unacceptable.

After cutoffs had been drawn for the two or three task areas, a group discussion was conducted on two task areas. The task areas discussed for each MOS are listed in Table 2.11. Individual Combat was always discussed first, followed by one MOS-specific task area. The workshop leader tallied the group's responses on a chalkboard and pointed out the effect of implementing the group's lowest, median, and highest standards, using the Project A test-score data. The workshop leader then directed a discussion of the ratings, asking participants to state specific positive or negative consequences in support of their cutoffs. Following the discussion, participants were asked to rerate the task areas discussed. The complete Task-Based Standard Setting exercise with discussion and rerates took approximately 1 hour. Chapter 5 describes the Task-Based Standard Setting exercise in detail; a copy of the instructions, rating forms, and group discussion script appear in Appendix A.

<u>Task Complexity Questionnaire</u>

The final instrument completed by participants was the Task Complexity Questionnaire. In this questionnaire, participants responded to 10 questions about a sample task from each of the two areas discussed in the Task-Based Standard Setting exercise. (See Table 2.11 for the list of task areas rated for each MOS and Figure 2.5 for the instructions and sample pages.) If a substitute task was used in place of the sample task in the Task-Based Standard Setting exercise, the same substitute was used for the Task Complexity Questionnaire. The 10 questions, designed to assess the complexity or difficulty of the sample task, were multiple choice and covered such things as job or memory aids and mental processing requirements of the task. Most participants completed this questionnaire within 20 minutes. The Task Complexity Questionnaire is discussed in detail in Chapter 6; a copy appears in Appendix A.

Table 2.11

List of Task Areas to Discuss by MOS

MOS	Task Area 1	Task Area 2
12B	M. Individual Combat	D. Vehicle & Equipment Operations
13B	M. Individual Combat	D. Vehicle & Equipment Operations
27E	M. Individual Combat	B. Electrical & Electronic System Maintenance
29E	M. Individual Combat	B. Electrical & Electronic System Maintenance
31C	M. Individual Combat	I. Communications
31D	M. Individual Combat	I. Communications
51B	M. Individual Combat	D. Vehicle & Equipment Operations
54B	M. Individual Combat	D. Vehicle & Equipment Operations
55B	M. Individual Combat	H. Clerical
95B	M. Individual Combat	H. Clerical
96B	M. Individual Combat	I. Communications

Name:____

Task Complexity Questionnaire

12B: Combat Engineer

In this exercise, we would like you to provide information about the complexity or difficulty of sample tasks selected from two fairly general areas. These areas could apply to more than one MOS; some examples are Individual Combat, Vehicle and Equipment Operation, and Communication.

For each of the two tasks presented, there are 10 questions about the task. For several questions, there are definitions and examples to clarify the meaning of the question. Please read all definitions and examples before selecting an answer.

NOTE: If the sample task is not performed in the MOS you are rating, please use the substitute task you used in the standard setting exercise.

Task Category: D. Vehicle and Equipment Operations -- Drive or operate heavy mechanical equipment.

Sample Task: Operate tractor/semitrailer

For the **Vehicle and Equipment Operations** task listed here, please answer the following 10 questions. The answers to these 10 questions will provide information on the complexity of the task that is performed by soldiers in the MOS you are rating.

Please circle the most appropriate answer to each question.

Figure 2.5. Instructions and sample pages from the Task Complexity Questionnaire.

Sample Task: Operate tractor/semitrailer

1. **Are job or memory aids used by the soldier in performing this task?**

   a. Yes
   b. No *(Go to No. 3 if you answer "No" to this question)*

Job and memory aids include memory joggers learned in school (e.g., S-A-L-U-T-E), instructions printed on or attached to equipment, checklists or worksheets, and manuals that are routinely used while performing the task.

2. **How would you rate the quality of the job or memory aid?**

   a. There are no job or memory aids for this task.
   b. Poor. Even with the job/memory aid, a typical soldier would need a great deal of additional information.
   c. Marginally Good. Even with the job/memory aid, a soldier would need important additional information.
   d. Very Good. With the job/memory aid, a soldier would need only a little additional information.
   e. Excellent. Using the job/memory aid, a soldier can do the entire task correctly with no additional information or help.

3. **Into how many steps is this task typically divided?**

   a. 1 Step
   b. 2-5 Steps
   c. 6-10 Steps
   d. More than 10 Steps

A step is a separate physical or mental activity within a task which has a well defined, observable beginning and ending point.

4. **Are the steps in this task required to be performed in a definite sequence?**

   a. The tasks typically have only 1 step.
   b. None are required to be performed in a particular sequence.
   c. Some, but not all steps must be performed in the correct sequence.
   d. All of the steps must be performed in the correct sequence.

5. **Does the task provide built-in feedback so that you can tell if you are doing them correctly?**

   a. Built-in feedback is provided for all steps
   b. Built-in feedback is provided for most steps (> 50%)
   c. Built-in feedback is provided for only a few steps
   d. No Built-in feedback is provided for any steps.

Examples of built-in feedback include disassembling equipment where removing one section automatically uncovers the next section; steps with observable effects such as buzzers, meter readings, warning lights; and operating equipment built to indicate a logical progression (for example, adjusting dials from left-to-right).

Figure 2.5. Instructions and sample pages from the Task Complexity Questionnaire (continued).

Sample Task: Operate tractor/semitrailer

6. **Does the task or parts of the task have a time limit for its completion?**

    a. There are no time limits
    b. There are time limits that are fairly easy to meet under test conditions
    c. There are time limits that are difficult to meet under test conditions.

7. **How difficult are the mental processing (thinking, analyzing, judging, inferring, and problem solving) requirements of this task?**

    a. Almost no mental processing is required (physical or highly repetitive tasks)
    b. Simple mental processing is required (gross comparisons, simple estimations or calculations)
    c. Complex mental processing is required (choices or decisions based on subtle but discrete clues)
    d. Very complex mental processing is required (rapid decisions, based on detailed information, often under stress)

8. **How many facts, terms, names, rules, or ideas must a soldier memorize in order to do this task?**

    a. None (or all are provided by memory/job aids)
    b. A few (1-3)
    c. Some (4-8)
    d. Very Many (more than 8)

9. **How hard are the facts or terms that must be remembered?**

    a. There are not facts or terms to be remembered
    b. Not at all hard - the information is simple
    c. Somewhat hard - some of the information is complex
    d. Very hard - the facts, rules, and terms are technical or specific to the task and must be remembered in exact detail.

10. **What are the motor control demands of this task?**

    a. None
    b. Small, but noticeable degree of motor control is required (such as driving a nail, adjusting a dial)
    c. Considerable degree of motor control is needed (such as typing, driving a manual shift vehicle, or tracking a moving target)
    d. A very large degree of motor control is needed (such as repair of delicate equipment, or sending Morse code using a key)

Figure 2.5. Instructions and sample pages from the Task Complexity Questionnaire (continued).

Chapter 3: Analysis of the Army Task Questionnaire

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In Phases I and II, the Army Task Questionnaire was shown to have good overall and within rater group reliability, to adequately cover the job performance domain, and to effectively discriminate among military occupational specialties (MOS). Based on these results and the need to identify a single instrument for describing jobs, the Army Task Questionnaire emerged as the prototypic job description instrument. In this chapter, we describe the Army Task Questionnaire and reexamine the issues of reliability, MOS coverage, and discrimination among MOS in light of data collected on the Phase III MOS. Data from Phases I and II are also included where applicable.

Instrument Description

The Army Task Questionnaire consists of 96 task categories that describe job content in terms of the tasks performed. It is designed to be used to describe all entry-level MOS. Seventeen task dimensions divide the 96 task categories at an intermediate level. Sixteen of these dimensions are further collapsed into four major divisions: (a) maintenance, (b) general operations, (c) administrative, and (d) combat. The seventeenth dimension, Supervision, is left separate. The task categories taxonomy is shown in Figure 3.1, and a complete copy of the questionnaire can be found in Appendix A, Attachment 1. The development of the Army Task Questionnaire is described in detail in Chapter 3 of the Phase I Synthetic Validity report (Chia, Hoffman, Campbell, Szenas, & Crafts, 1989).

In using the Army Task Questionnaire, SMEs were asked to consider the entire range of duty assignments for soldiers with 24 months experience beyond Basic Training and Advanced Individual Training (AIT) in their particular MOS. They were to complete the questionnaire from this frame of reference. SMEs first rated how frequently the tasks in each category are performed by such soldiers on a scale from 0 (Never; this task is not part of the job) to 5 (Most Often; this task is performed much more often than most other tasks). After providing Frequency ratings for all 96 tasks categories, participants rated the Importance and Difficulty of only those categories identified as performed by soldiers with 24 months experience in the MOS (i.e., task categories with non-zero Frequency ratings). Importance ratings were collected for three areas of job performance: Core Technical, General Soldiering, and Overall Job. The Core Technical and General Soldiering areas correspond to the Project A distinction between the performance requirements of an MOS that are the central aspects of the MOS and that define

I. Maintenance
   A. Mechanical Systems Maintenance
      1. Perform operator maintenance checks and services
      2. Perform operator checks and services on weapons
      3. Troubleshoot mechanical systems
      4. Repair weapons
      5. Repair mechanical systems
      6. Troubleshoot weapons

   B. Electrical and Electronic Systems Maintenance
      7. Install electronic components
      8. Inspect electrical systems
      9. Inspect electronic systems
      10. Repair electrical systems
      11. Repair electronic components

II. General Operations
   C. Pack and Load
      12. Pack and load materials
      13. Prepare parachutes
      14. Prepare equipment and supplies for air drop

   D. Vehicle and Equipment Operations
      15. Operate power excavating equipment
      16. Operate wheeled vehicles
      17. Operate track vehicles
      18. Operate boats
      19. Operate lifting, loading, and grading equipment

   E. Construct/Assemble
      20. Paint
      21. Install wire and cables
      22. Repair plastic and fiberglass
      23. Repair metal
      24. Assemble steel structures
      25. Install pipe assemblies
      26. Construct wooden buildings and other structures
      27. Construct masonry buildings and structures

   F. Technical Procedures
      28. Operate gas and electric powered equipment
      29. Select, layout, and clean medical/dental equipment and supplies
      30. Use audiovisual equipment
      31. Reproduce printed material
      32. Operate electronic equipment
      33. Operate radar
      34. Operate computer hardware
      35. Cook
      36. Perform medical laboratory procedures
      37. Conduct land surveys
      38. Provide medical or dental treatment

Figure 3.1. Task category taxonomy.

- G. Make Technical Drawings
    - 39. Sketch maps, overlays, or range cards
    - 40. Produce technical drawings
    - 41. Draw maps and overlays
    - 42. Draw illustrations

III. Administrative

- H. Clerical
    - 43. Type
    - 44. Prepare technical forms and documents
    - 45. Record, file, and dispatch information
    - 46. Receive, store, and issue supplies, equipment, other materials

- I. Communication
    - 47. Use hand and arm signals
    - 48. Read technical manuals, field manuals, regulations, and other publications
    - 49. Use maps
    - 50. Send and receive radio messages
    - 51. Give oral reports
    - 52. Receive clients, patients, guests
    - 53. Give directions and instructions
    - 54. Write documents and correspondence
    - 55. Write and deliver presentations
    - 56. Interview
    - 57. Provide counseling and other interpersonal interventions

- J. Analyze Information
    - 58. Decode data
    - 59. Analyze electronic signals
    - 60. Analyze weather conditions
    - 61. Order equipment and supplies
    - 62. Estimate time and cost of maintenance operations
    - 63. Plan placement or use of tactical equipment
    - 64. Translate foreign languages
    - 65. Analyze intelligence data

- K. Applied Math and Data Processing
    - 66. Control money
    - 67. Determine firing data for indirect fire weapons
    - 68. Compute statistics or other mathematical calculations
    - 69. Provide programming and data processing support for computer operations

- L. Control Air Traffic
    - 70. Control air traffic

Figure 3.1. Task category taxonomy (continued).

IV. Combat

M. Individual Combat

71. Use hand grenades
72. Protect against NBC hazards
73. Handle demolitions or mines
74. Engage in hand-to-hand combat
75. Fire individual weapons
76. Control individuals and crowds
77. Customs and laws of war
78. Navigate
79. Survive in the field
80. Move and react in the field

N. Crew-served Weapons

81. Load and unload field artillery or tank guns
82. Fire heavy direct fire weapons (e.g., tank main guns, TOW missile, IFV cannon)
83. Prepare heavy weapons for tactical use
84. Place and camouflage tactical equipment and materials in the field
85. Fire indirect fire weapons (e.g., field artillery)

O. Give First Aid

86. Give first aid

P. Identify Targets

87. Detect and identify targets

Q. Supervision (not included in any of the four major divisions)

88. Plan Operations
89. Direct/Lead Teams
90. Monitor/Inspect
91. Lead
92. Act as a Model
93. Counsel
94. Communicate
95. Train
96. Personnel Administration

Figure 3.1. Task category taxonomy (continued).

essential character of the job versus those performance requirements that are part of every soldier's role in the Army regardless of MOS (Campbell, McHenry, & Wise, 1990). Importance was rated on a scale from 0 (No Importance) to 5 (Extremely High Importance). SMEs provided Difficulty ratings by answering the following question: "How difficult is it to reach and maintain an acceptable level of proficiency in this task?" Difficulty was rated on a scale from 1 (Very Easy; this task can be performed correctly after less than an hour of instruction and performed

again correctly a year later with little or no practice in between) to 5 (Very Difficult; this task can be performed correctly after several weeks of instruction and performed again correctly only if it is practiced regularly). The Difficulty scale was added to the Phase III Army Task Questionnaire to be explored for use in standard setting.

After completing the Army Task Questionnaire, SMEs estimated the percentage of the MOS performance domain that was covered by the questionnaire. Specifically, participants answered the following question: "What percentage of the MOS you are rating is covered by these task categories?" Participants who indicated that less than 100% of the MOS was covered were asked to suggest items that should be added.

Editing and Handling of Missing Data

Each completed Army Task Questionnaire was screened for three kinds of rating errors. First, missing responses to the frequency question were noted. Second, inappropriate missing responses to the Importance and Difficulty questions were noted. That is, every task category given a non-zero Frequency rating should have also been rated for Importance in the three performance areas and for Difficulty. The third error that was screened for was inappropriate responses to Importance and Difficulty. Tasks with zero Frequency should not have been rated for Importance or Difficulty. This last screen checked only for inappropriate non-zero Importance and Difficulty ratings. Raters had a tendency to fill in zero Importance and Difficulty for tasks with zero Frequency. While not instructed to do so, these ratings do not constitute rating errors and, in fact, conform to our coding scheme (see Descriptive Statistics below).

Each of the three errors was tabulated. Twenty-two respondents were identified with missing Frequency ratings, inappropriate missing Importance ratings, or inappropriate non-zero Importance ratings for more than 10% of the task categories. These individuals were dropped from further Army Task Questionnaire analysis. An additional nine respondents were dropped from analyses involving the Difficulty scale because of inappropriate Difficulty ratings. Table 3.1 indicates the MOS these respondents represented.

Table 3.1

Respondents Dropped from Army Task Questionnaire Analyses

MOS	Number
12B	4
13B	7
27E	1
29E	3
31C	1
31D	0
51B	1
54B	6
55B	2
95B	2
96B	4
Total	31

Content of the Army Task Questionnaire

Two items in the Army Task Questionnaire were included to evaluate the content of the Army Task Questionnaire. The first item, "percentage of MOS covered", asked SMEs to estimate the percentage of the job domain covered by the questionnaire. The second item was directed toward SMEs who indicated in the first item that their MOS was not fully covered. These SMEs were asked to list the tasks that were omitted. In previous phases of the project, raters often indicated that the questionnaire covered less than 100% of their MOS and then were unable to list new tasks that were not already included in one or more of the existing task categories. Therefore, we have taken the position that responses to the first question cannot be taken at face value, but must be supported by appropriate responses to the second question. Responses to the second question therefore serve as the source of information concerning desirable modifications to the questionnaire content.

The content of the responses to the second coverage question were thoroughly reviewed. Items that were suggested by three or more SMEs within an MOS were noted and checked against the Army Task Questionnaire. If the suggested item is not included in the questionnaire, it is presented in Table 3.2. As in previous phases, many of the suggestions do not fit our concept of a task. For example, physical fitness is cited by raters from several MOS, but it is outside the performance domain targeted by the Army Task Questionnaire. Likewise, safety, per se, is not a task. Rather, safety is a generic concept that implies performing any task according to its acceptable procedure. Other

items are too broad to interpret. One item suggested by Phase III participants was also a suggested item in Phase II. That concerns use of light crew-served weapons. This item could be a candidate for inclusion in Dimension N (Crew-served Weapons). Finally, use of tools and tool maintenance is consistently suggested. In revising the Army Task Questionnaire during pre-test and pilot-test phases of the project (i.e., prior to Phase I), such an item was considered to be implicit in the various maintenance task categories included. Given the consistency of the suggestion, tool maintenance may be another candidate for inclusion in the questionnaire.

Table 3.2

Suggested Content for Inclusion on the Army Task Questionnaire

MOS	Number of Times Suggested	Suggested Additions
12B	6	Physical Fitness
13B	3	Physical Fitness
27E	4	Physical Fitness
	2	Safety
	8	Hand Tool Maintenance
29E	4	Use of Tools and Test Equipment
31C	3	Physical Fitness
31D	3	Physical Fitness
51B	8	Tool Maintenance
	5	Safety
54B	3	Physical Fitness
55B	4	Fire Control
95B	12	Physical Security
	3	Light Crew-served Weapons
	4	Decision Making[a]
	4	Physical Fitness
	7	Law Enforcement[a]
	4	Investigations[a]
96B	10	Physical Security
	4	Personnel Security

[a]These tasks are very broad. No guidance was given in the written comments as to what these tasks actually encompass.

Several SMEs were distracted by the fact that a large proportion of the task categories did not specifically include *examples* from their MOS. Most tasks recommended for addition to the questionnaire are examples of existing task categories. The suggested example tasks fall into one of two groups. The first

and largest group consists of tasks which are subsumed under an existing task category but are not specifically listed. For example, Task Category 48 "Read Technical Manuals, Field Manuals, Regulations, and Other Publications" includes "reading instructions, diagrams, charts, and tables." However, because reading blueprints and site layouts are not specified, several 51B SMEs suggested it be added. This error occurred in previous phases in spite of written and verbal instructions explaining that the examples listed under each task category are examples only and are not meant to be exhaustive.

The second group of example tasks recommended for addition contains examples that are already specified on the questionnaire. For instance, the suggested additions "install and operate antenna systems" are specifically listed under Task Category 7 "Install Electronic Components." Perhaps, the participants who listed such additions read only the general task category title and did not read the examples included in that category. Alternatively, they may have simply forgotten that the task was covered by the time they reached the end of the long questionnaire.

Although some suggested additions appear to be task categories that have been omitted, we decided not to revise the Army Task Questionnaire at this time. A consideration of the practical implications of revising the questionnaire justifies our decision. First, there appears to be no strong consensus among SMEs that particular task categories have been omitted. In other words, no suggested addition was overwhelmingly stated by a large group of SMEs. Second, psychologists' validity estimates are available only for the existing 96 task categories. Obtaining validity estimates for a few new task categories cannot be accomplished at this stage of the project. Third, discriminant validity results (presented in the following chapter) suggest that adding a limited number of task categories would have no impact on synthetic validity equations.

Descriptive Statistics

For each of the 11 Phase III MOS, means, standard deviations, and sample sizes for Frequency, Core Technical Importance, General Soldiering Importance, Overall Job Importance, and Difficulty ratings were calculated. Table 3.3 presents the means of the Core Technical Importance ratings for each of the Phase III MOS for the Army Task Questionnaire. We frequently refer to these mean ratings as "profiles." Mean Core Technical Importance ratings of 3.5 or higher are highlighted. Appendix B presents the complete results for means of the different types of ratings for each MOS in order of decreasing Frequency.

When the questionnaire was administered, participants provided Frequency ratings for all items and Importance and Difficulty ratings for only those items with non-zero Frequency

Table 3.3

Army Task Questionnaire Mean Core Technical Importance Ratings for Phase III MOS

Task Categories	MOS 12B N=77	13B N=69	27E N=34	29E N=49	31C N=76	31D N=17	51B N=80	54B N=67	55B N=61	95B N=75	96B N=60
A. Mechanical Systems Maintenance											
Perform op maint checks/services	3.71	4.26	3.58	2.87	4.29	4.17	3.47	4.16	3.48	3.74	1.60
Perform op checks/services on weapons	3.69	4.33	2.67	2.36	2.78	1.41	2.55	3.00	2.65	4.20	1.67
Troubleshoot mechanical systems	1.02	2.24	1.97	0.85	1.65	2.11	0.96	1.98	0.68	0.48	0.08
Repair weapons	0.54	2.53	3.11	0.18	0.44	0.29	0.23	0.46	0.55	0.70	0.11
Repair mechanical systems	1.51	2.98	3.55	1.83	1.59	1.29	1.60	2.46	0.75	0.86	0.21
Troubleshoot weapons	1.44	3.40	3.70	0.59	1.19	0.47	1.02	1.49	0.95	1.40	0.30
B. Electrical and Electronic Systems Maintenance											
Install electronic components	1.96	2.30	3.73	4.46	4.44	4.29	0.95	1.72	0.42	2.32	1.81
Inspect electrical systems	0.45	1.07	4.02	4.46	2.89	2.76	0.98	0.61	0.32	0.22	0.16
Inspect electronic systems	0.14	0.69	4.38	4.71	2.73	2.41	0.21	0.31	0.23	0.20	0.21
Repair electrical systems	0.33	0.70	4.11	4.42	1.61	1.58	1.00	0.44	0.32	0.21	0.00
Repair electronic components	0.14	0.44	4.26	4.65	1.32	1.47	0.31	0.34	0.21	0.14	0.06
C. Pack and Load											
Pack/load materials	2.11	3.07	1.73	1.69	2.48	1.70	2.06	2.04	3.66	2.01	1.03
Prepare parachutes	0.32	0.46	0.02	0.24	0.25	0.05	0.00	0.13	0.29	0.08	0.08
Prepare equip/supplies for air drop	1.00	1.31	0.44	0.46	0.52	0.17	0.06	0.62	1.74	0.38	0.11
D. Vehicle and Equipment Operations											
Operate power excavating equipment	2.54	0.13	0.00	0.04	0.01	0.00	3.17	0.00	0.27	0.05	0.00
Operate wheeled vehicle	3.67	4.04	3.55	2.55	3.88	3.76	3.40	3.68	3.24	4.38	1.93
Operate track vehicle	2.72	3.37	0.88	0.30	1.07	0.00	0.15	2.29	0.34	0.34	1.23
Operate boats	1.75	0.00	0.00	0.06	0.01	0.00	0.08	0.01	0.09	0.36	0.00
Operate lift/load/grade equipment	1.14	0.24	0.05	0.10	0.06	0.00	0.63	0.13	4.28	0.02	0.00
E. Construct/Assemble											
Paint	1.23	1.39	1.35	0.71	1.36	1.11	3.17	1.18	2.15	0.77	0.13
Install wire/cables	1.42	2.53	1.55	2.35	3.21	3.93	1.83	1.37	0.55	1.21	0.78
Repair plastic/fiberglass	0.23	0.18	2.45	0.24	0.15	0.05	1.18	0.16	0.13	0.02	0.00
Repair metal	0.54	0.37	0.91	0.42	0.30	0.05	1.67	0.20	0.24	0.14	0.01
Assemble steel structures	2.57	0.29	0.05	0.55	1.10	1.94	2.84	0.10	0.16	0.20	0.25
Install pipe assemblies	0.39	0.13	0.00	0.02	0.03	0.00	2.31	0.44	0.16	0.02	0.00
Construct wooden bldgs/structures	2.87	0.31	0.05	0.02	0.09	0.11	4.74	0.01	0.54	0.12	0.05
Construct masonry bldgs/structures	1.97	0.14	0.00	0.02	0.02	0.05	4.58	0.04	0.09	0.02	0.01

(table continues)

Table 3.3 (continued)

Task Categories	MOS 12B N=77	13B N=69	27E N=34	29E N=49	31C N=76	31D N=17	51B N=80	54B N=67	55B N=61	95B N=75	96B N=60
F. Technical Procedures											
Operate gas/electric power equipment	2.03	0.94	2.26	2.55	4.02	3.05	3.25	3.83	1.80	1.42	0.81
Select/layout/clean med/dental equip	0.00	0.04	0.05	0.06	0.03	0.00	0.00	0.01	0.06	0.00	0.00
Use audiovisual equipment	0.45	0.30	0.47	0.55	0.54	0.00	0.17	0.59	0.60	1.04	2.20
Reproduce printed material	0.31	0.40	0.35	0.40	0.70	0.64	0.30	0.61	0.63	0.74	2.15
Operate electronic equipment	1.85	2.01	4.00	4.40	4.52	4.58	0.73	2.59	0.80	2.60	2.81
Operate radar	0.00	0.13	0.14	0.51	0.10	0.00	0.00	0.01	0.18	0.94	0.13
Operate computer hardware	0.29	0.49	1.47	1.18	1.60	1.05	0.13	0.83	0.74	1.48	3.30
Cook	0.00	0.18	0.00	0.00	0.06	0.11	0.05	0.00	0.19	0.05	0.03
Perform medical laboratory procedures	0.00	0.10	0.00	0.00	0.05	0.05	0.03	0.00	0.18	0.00	0.00
Conduce land surveys	1.71	1.77	0.55	0.24	1.78	1.82	1.26	1.80	0.91	1.62	1.28
Provide medical/dental treatment	0.06	0.24	0.00	0.00	0.15	0.11	0.05	0.01	0.16	0.22	0.05
G. Make Technical Drawings											
Sketch maps/overlays/range cards	3.45	3.36	1.58	0.81	1.94	0.41	1.67	3.04	1.50	3.70	3.81
Produce technical drawings	0.44	0.08	0.17	0.10	0.13	0.00	0.93	0.28	0.26	0.20	0.56
Draw maps/overlays	0.77	0.59	0.17	0.16	0.46	0.05	0.33	1.03	0.41	0.93	2.41
Draw illustrations	0.58	0.22	0.35	0.32	0.32	0.47	1.23	0.42	0.34	0.58	1.10
H. Clerical											
Type	0.61	0.65	0.79	1.24	4.23	1.00	0.37	1.06	1.21	2.20	3.48
Prepare technical forms/documents	1.11	2.02	3.00	2.91	2.80	2.00	0.87	2.11	2.54	3.45	3.16
Record/file/dispatch information	0.85	1.14	2.05	1.42	1.52	1.00	0.57	1.92	2.30	2.34	3.41
Receive/store/issue supplies/equip	0.93	1.14	1.76	1.93	0.88	0.64	1.31	[illegible].74	4.16	0.85	1.00
I. Communication											
Use hand & arm signals	2.84	3.40	0.79	0.91	1.54	1.58	1.93	2.78	2.75	3.83	0.75
Read tech manual/field manual/reg/etc	3.71	3.79	4.41	4.49	4.27	4.35	3.58	4.25	3.57	3.45	3.90
Use maps	4.20	3.63	2.70	2.14	3.61	3.88	2.47	4.20	2.49	4.38	4.66
Send/receive radio messages	3.75	2.89	2.14	2.69	4.63	4.35	1.90	3.70	2.23	4.46	3.76
Give short oral reports	3.27	2.71	1.23	1.22	2.38	2.11	1.91	2.98	1.41	3.92	4.06
Receive clients/patients/guests	0.13	0.18	0.26	0.12	0.22	0.05	0.10	0.07	0.23	0.85	0.25
Give directions/instructions	3.42	3.08	2.91	2.26	2.94	2.93	2.97	3.25	2.56	4.08	3.30
Write/deliver presentations	0.86	0.53	0.78	0.71	0.65	0.43	0.35	1.29	0.60	1.22	4.00
Interview	0.38	0.71	0.38	0.40	0.13	0.35	0.12	0.46	0.38	4.37	1.66
Provide counseling	1.62	1.81	1.51	1.24	1.78	2.00	0.90	1.10	1.44	3.09	1.21
Write documents/correspondence	0.70	0.73	0.97	0.91	1.15	0.58	0.60	1.38	0.75	2.88	3.67

(table continues)

Table 3.3 (continued)

Task Categories	MOS 12B N=77	13B N=69	27E N=34	29E N=49	31C N=76	31D N=17	51B N=80	54B N=67	55B N=61	95B N=75	96B N=60
J. Analyze Information											
Decode data	2.50	2.07	0.85	1.16	4.05	2.23	0.68	2.32	0.68	3.28	2.83
Analyze electronic signals	0.06	0.08	0.17	0.87	2.76	1.88	0.03	0.41	0.11	0.80	0.47
Analyze weather conditions	0.93	0.55	0.11	0.10	1.62	1.35	0.48	2.86	0.32	0.88	3.40
Order equipment/supplies	1.31	1.94	2.97	2.63	2.46	1.94	1.73	2.50	1.42	0.98	1.32
Estimate time/cost of maintenance ops	0.37	0.30	1.67	1.79	0.40	0.35	0.55	0.53	0.34	0.24	0.05
Plan placement/use tactical equipment	2.78	2.42	1.56	0.93	2.77	2.06	0.86	2.44	1.21	2.80	1.98
Translate foreign languages	0.06	0.11	0.05	0.08	0.11	0.11	0.07	0.04	0.23	0.61	0.38
Analyze intelligence data	0.80	0.57	0.20	0.26	0.51	0.75	0.12	0.61	0.19	1.45	4.85
K. Applied Math and Data Processing											
Control money	0.10	0.39	0.02	0.10	0.15	0.05	0.22	0.04	0.37	0.21	0.05
Determine fire data-indirect weapon	0.72	1.89	0.05	0.24	0.18	0.00	0.22	0.28	0.47	0.93	0.48
Compute statistics/other mathematics	2.53	1.15	1.17	1.04	1.21	0.05	2.28	2.65	1.47	0.96	1.61
Provide programming/DP support	0.03	0.27	0.20	0.02	0.28	0.00	0.10	0.10	0.45	0.18	0.71
L. Control Air Traffic											
Control air traffic	0.11	0.23	0.00	0.02	0.11	0.00	0.00	0.00	0.27	0.18	0.00
M. Individual Combat											
Use hand grenades	3.07	2.71	0.70	0.65	1.20	0.62	1.15	1.95	2.54	2.68	0.68
Protect against NBC hazards	3.54	3.92	2.73	1.87	3.21	2.17	2.16	4.86	3.41	3.90	1.81
Handle demolitions/mines	4.54	2.10	0.29	0.53	0.34	0.11	2.61	2.14	3.37	1.64	0.33
Engage in hand-to-hand combat	2.59	1.56	0.29	0.24	0.60	0.43	0.69	1.16	0.95	3.69	0.40
Fire individual weapons	3.87	3.81	2.05	1.81	2.65	1.23	2.34	3.09	2.58	4.54	1.60
Control individuals/crowds	2.32	2.30	0.52	0.79	1.16	1.06	1.20	1.47	1.70	4.37	0.93
Know customs/laws of war	2.39	2.42	1.02	0.89	1.60	1.25	1.30	2.09	1.78	4.02	1.56
Navigate	3.84	3.43	1.97	1.71	2.86	1.88	1.86	3.52	2.24	4.37	1.96
Survive in the field	3.81	3.94	2.29	1.87	3.27	2.75	2.25	3.58	2.76	4.25	2.01
Move/react in the field	3.63	2.91	1.21	1.26	1.84	0.87	1.75	2.38	1.90	3.66	1.20
N. Crew-served Weapons											
Load/unload artillery/tank guns	0.05	4.72	0.02	0.02	0.07	0.00	0.03	0.00	0.51	0.02	0.00
Fire heavy direct fire weapons	0.46	2.92	0.41	0.08	0.03	0.00	0.00	0.04	0.18	0.09	0.00
Prep heavy weapons for tactical use	0.09	4.59	0.55	0.02	0.01	0.00	0.02	0.00	0.11	0.02	0.00
Place/camoufl tactical equip/material	4.05	3.98	1.94	1.14	2.53	3.25	2.15	3.26	1.82	2.90	1.03
Fire indirect fire weapons	0.15	4.63	0.00	0.08	0.09	0.00	0.05	0.00	0.34	0.14	0.00

(table continues)

Table 3.3 (continued)

Task Categories	MOS 12B N=77	13B N=69	27E N=34	29E N=49	31C N=76	31D N=17	51B N=80	54B N=67	55B N=61	95B N=75	96B N=60
O. Give First Aid											
Give first aid	3.46	3.34	2.15	2.14	2.59	1.93	2.51	3.07	3.01	4.26	1.30
P. Identify Targets											
Detect/identify targets	2.81	2.85	1.18	1.00	1.38	0.11	1.15	2.16	1.83	3.37	2.30
Q. Supervision											
Plan operations	2.28	1.47	2.12	1.08	1.73	2.05	1.41	2.37	1.83	2.54	1.65
Direct/lead teams	3.00	2.21	1.69	0.42	1.68	1.11	1.36	2.68	1.44	3.06	0.83
Monitor/inspect	2.87	2.60	3.30	1.95	2.96	3.11	2.28	3.04	2.11	3.08	2.28
Lead	3.42	3.01	3.09	2.77	3.13	3.76	2.78	2.73	2.70	3.62	3.06
Act as a model	3.37	3.25	3.55	3.10	3.13	3.47	3.17	2.97	2.88	4.26	3.13
Counsel	2.55	2.69	2.64	2.02	2.77	3.50	2.12	1.92	2.72	3.10	2.53
Communicate	3.10	2.95	3.35	2.77	3.06	3.35	2.67	2.77	3.00	3.65	3.55
Train	2.80	2.86	2.85	2.62	3.29	3.52	2.17	3.00	2.70	3.09	2.93
Personnel Administration	1.45	1.88	2.11	1.49	2.16	2.11	1.52	1.47	2.06	2.29	2.25

Note. N = total number of participants from each MOS. Due to missing data, some table entries are based on smaller samples.

ratings. In calculating descriptive statistics, Importance and Difficulty values for task categories with zero Frequency ratings were set to zero rather than treated as missing. Given the rating procedure employed, a zero Frequency rating implies zero Importance and Difficulty ratings, and these zero ratings should be considered when examining the mean importance of items.

Reliability Analyses

Approach

Army Task Questionnaire ratings were obtained from raters of different ranks (NCO, Officer, Civilian) representing different commands (TRADOC MOS proponent agencies and operational Table of Organization and Equipment [TO&E] units). Reliability questions for the Army Task Questionnaire revolve around two overlapping issues: (a) Do raters within the same rater group agree with each other? and (b) Do ratings from the different rater groups agree? An alternative way to phrase the second issue is: Do raters combined from all rater groups agree with each other? These questions were addressed separately for each MOS, and the results were summarized across MOS.

For the Phase III Army Task Questionnaire data, the reliability estimation procedure paralleled the procedure used in Phases I and II for the Attribute Questionnaire. The procedure is a simplification of the fully developed generalizability model used for combined rater groups in Phase I and II analyses of the Task and Activity Questionnaires. Instead of explicitly teasing out variance components for rank and command, only task category and rater components were estimated. These were then appropriately combined into a reliability coefficient that treats task categories (the objects of measurement) as fixed, raters as random, and includes both rater variance and rater-by-task category variance as measurement error. Formulas may be found in Brennan (1983). In the Phase I and II reports, the explicit interpretation of the rank and command variance components tended to be ignored. Instead, combined group reliabilities were compared to within-group reliabilities to determine agreement across rater groups. Thus, if rater groups disagreed with each other, then combined group reliabilities would be noticeably lower than within-group reliabilities.

Because data for the full generalizability model is neither fully complete nor balanced, previous analyses required computation by an expensive variance components estimate procedure on a mainframe computer. The data for the simpler procedure of estimating only task category and rater variance is complete. It can be executed on a personal computer and is therefore much more economical. It is supplemented with supporting analyses that make the amount of information obtained concerning rater agreement as comprehensive as that reported in Phases I and II.

Results

Table 3.4 presents the single-rater reliability estimates for each rater group and for combined rater groups for each MOS. Single-rater reliability estimates are appropriate for comparing differences among rater groups and MOS, and they provide the basic data needed to make projections (i.e., via Spearman-Brown) concerning the number of raters needed in future uses of the Army Task Questionnaire. Table 3.5 summarizes the single-rater reliabilities by presenting mean reliabilities across the MOS for each rating scale and across all rating scales. Reliabilities were computed only for rater groups with four or more raters.

Because mean profiles, presented in Table 3.3 and Appendix B, were calculated using all raters combined, Table 3.4 also presents reliability estimates based on all raters within each MOS. These were calculated by stepping up the single-rater reliability for all raters combined (the next to last column in Table 3.4) to estimate total reliability with all raters. For example, 77 is the total number of raters for 12B. Therefore, 77 was used to estimate the total reliability for all rating scales (Frequency, Core Technical Importance, General Soldiering Importance, Overall Job Importance, and Difficulty) for 12B.

Differences among reliability estimates. In general, the single-rater reliabilities are high for all scales and for all rater groups. Because of the large number of raters in the sample, many of the reliabilities for the mean ratings approach .99. Based on the single-rater reliability estimates, group reliabilities would exceed .90 for all of the Frequency and Importance ratings with as few as 10 raters. However, there are a number of comparisons to consider. These include differences between the rater groups and differences among the reliabilities of the scales. For the rater groups, differences between Officers and NCOs (across commands) and differences between commands (across Officers and NCOs) are of most interest. Also, civilian reliabilities compared to the soldiers' (Officers and NCOs combined) are of interest. For the scales, the differences of greatest interest are those between the Frequency scale and the Importance scales, and those between the Difficulty scale and the Frequency and Importance scales.

Using the single-rater reliabilities from Table 3.4 with appropriate coding for rank, command, and scale, a series of orthogonal, planned comparisons were conducted to test the statistical significance among differences in the reliability estimates. Based on reliabilities computed on all rater groups (the next to last column in Table 3.4), Frequency and Importance reliabilities are not detectably different ($F_{1,50}$ = 2.16, ns), but Difficulty reliabilities are lower than those for Frequency and Importance ($F_{1,50}$ = 39.49, $p < .01$). Rater group comparisons showed no rank differences ($F_{1,142}$ = 1.10, ns). Finally, FORSCOM raters agreed more among themselves than TRADOC raters ($F_{1,103}$ = 6.12, $p < .02$). Even for the statistically significant

Table 3.4

Army Task Questionnaire: Reliability Estimates by MOS

		Single-Rater Reliabilities											
		TRADOC				FORSCOM			COMBINED				Total r_{ll} with all raters
MOS	Rating Scale	NCO	OFF	CIV	TOT	NCO	OFF	TOT	NCO	OFF	CIV	TOT	
12B	N of raters	12	13	2	27	29	21	50	41	34	2	77	77
	Frequency	.60	.59	---	.59	.63	.64	.63	.62	.62	---	.61	.99
	Core Tech Imp	.56	.49	---	.52	.54	.59	.55	.55	.55	---	.54	.99
	Gen Soldier Imp	.57	.56	---	.56	.63	.64	.63	.60	.61	---	.60	.99
	Overall Job Imp	.62	.55	---	.58	.64	.65	.64	.63	.61	---	.61	.99
	Difficulty	.46	.37	---	.40	.46	.45	.45	.45	.42	---	.43	.98
13B	N of raters	8	6	6	20	26	23	49	34	29	6	69	69
	Frequency	.44	.60	.49	.49	.56	.55	.56	.53	.56	.49	.54	.99
	Core Tech Imp	.44	.57	.44	.48	.55	.49	.52	.53	.50	.44	.51	.99
	Gen Soldier Imp	.37	.51	.44	.43	.52	.52	.52	.47	.52	.44	.49	.99
	Overall Job Imp	.46	.54	.43	.47	.55	.55	.55	.52	.54	.43	.52	.99
	Difficulty	.30	.41	.28	.35	.38	.43	.40	.37	.42	.28	.39	.98
27E	N of raters	13	0	3	16	15	3	18	28	3	3	34	34
	Frequency	.65	---	---	.61	.55	---	.52	.59	---	---	.56	.98
	Core Tech Imp	.59	---	---	.57	.50	---	.47	.53	---	---	.51	.97
	Gen Soldier Imp	.55	---	---	.50	.50	---	.49	.52	---	---	.49	.97
	Overall Job Imp	.59	---	---	.55	.54	---	.52	.55	---	---	.53	.97
	Difficulty	.46	---	---	.45	.48	---	.46	.45	---	---	.44	.96

(table continues)

Table 3.4 (continued)

MOS	Rating Scale	Single-Rater Reliabilities: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{ii} with all raters
29E	N of raters	12	2	3	17	28	4	32	40	6	3	49	49
	Frequency	.50	---	---	.50	.59	.64	.59	.56	.61	---	.56	.98
	Core Tech Imp	.44	---	---	.45	.51	.49	.51	.48	.51	---	.49	.98
	Gen Soldier Imp	.40	---	---	.37	.50	.47	.50	.47	.48	---	.46	.98
	Overall Job Imp	.48	---	---	.45	.54	.55	.54	.51	.55	---	.51	.98
	Difficulty	.34	---	---	.36	.47	.45	.47	.42	.45	---	.42	.97
31C	N of raters	14	12	1	27	27	22	49	41	34	1	76	76
	Frequency	.55	.55	---	.54	.60	.60	.59	.58	.58	---	.57	.99
	Core Tech Imp	.52	.45	---	.44	.54	.54	.53	.53	.50	---	.50	.99
	Gen Soldier Imp	.50	.55	---	.50	.56	.58	.56	.53	.57	---	.54	.99
	Overall Job Imp	.51	.52	---	.50	.56	.59	.57	.54	.57	---	.54	.99
	Difficulty	.38	.38	---	.36	.43	.50	.46	.41	.45	---	.42	.98
31D	N of raters	15	1	1	17	0	[illegible]	0	15	1	1	17	17
	Frequency	.56	---	---	.54	---	---	---	.56	---	---	.54	.95
	Core Tech Imp	.53	---	---	.51	---	---	---	.53	---	---	.51	.95
	Gen Soldier Imp	.46	---	---	.44	---	---	---	.46	---	---	.44	.93
	Overall Job Imp	.47	---	---	.46	---	---	---	.47	---	---	.46	.94
	Difficulty	.34	---	---	.34	---	---	---	.34	---	---	.34	.98
51B	N of raters	12	11	6	29	30	21	51	42	32	6	80	80
	Frequency	.59	.50	.50	.52	.53	.51	.51	.53	.50	.50	.50	.99
	Core Tech Imp	.48	.42	.46	.43	.46	.49	.45	.45	.46	.46	.42	.98
	Gen Soldier Imp	.53	.56	.50	.51	.53	.57	.53	.51	.56	.50	.51	.99
	Overall Job Imp	.55	.51	.50	.51	.55	.53	.54	.54	.52	.50	.51	.99
	Difficulty	.45	.40	.48	.41	.43	.43	.42	.43	.41	.48	.41	.98

(table continues)

Table 3.4 (continued)

MOS	Rating Scale	Single-Rater Reliabilities: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{11} with all raters
54B	N of raters	13	13	2	28	24	15	39	37	28	2	67	67
	Frequency	.51	.66	---	.56	.51	.43	.47	.50	.50	---	.49	.99
	Core Tech Imp	.53	.57	---	.51	.51	.44	.48	.52	.47	---	.48	.98
	Gen Soldier Imp	.55	.66	---	.57	.56	.50	.54	.56	.56	---	.55	.99
	Overall Job Imp	.54	.65	---	.56	.55	.48	.52	.55	.53	---	.53	.99
	Difficulty	.46	.48	---	.44	.37	.37	.37	.40	.41	---	.39	.98
55B	N of raters	13	5	6	24	30	7	37	43	12	6	61	61
	Frequency	.44	.44	.42	.43	.48	.58	.49	.45	.51	.42	.45	.98
	Core Tech Imp	.46	.35	.30	.37	.43	.55	.43	.42	.43	.30	.40	.98
	Gen Soldier Imp	.45	.29	.29	.38	.48	.50	.48	.46	.42	.29	.44	.98
	Overall Job Imp	.44	.24	.28	.35	.48	.53	.48	.46	.41	.28	.42	.98
	Difficulty	.20	.21	.29	.22	.37	.38	.37	.31	.31	.29	.30	.96
95B	N of raters	15	11	0	26	29	20	49	44	31	0	75	75
	Frequency	.63	.63	---	.63	.62	.65	.63	.62	.63	---	.62	.99
	Core Tech Imp	.62	.61	---	.61	.63	.67	.64	.62	.63	---	.63	.99
	Gen Soldier Imp	.60	.60	---	.60	.60	.64	.62	.60	.61	---	.61	.99
	Overall Job Imp	.61	.61	---	.61	.61	.66	.63	.61	.63	---	.62	.99
	Difficulty	.49	.40	---	.45	.44	.50	.46	.46	.46	---	.45	.98
96B	N of raters	16	0	5	21	26	12	39	42	12	6	60	60
	Frequency	.53	---	.55	.52	.59	.62	.59	.57	.62	.50	.56	.99
	Core Tech Imp	.54	---	.55	.53	.57	.60	.57	.56	.60	.51	.56	.99
	Gen Soldier Imp	.59	---	.48	.56	.55	.61	.56	.56	.61	.44	.56	.99
	Overall Job Imp	.60	---	.52	.58	.58	.62	.58	.59	.62	.49	.58	.99
	Difficulty	.46	---	.48	.46	.44	.55	.46	.45	.55	.45	.46	.98

Table 3.5

Army Task Questionnaire Mean Reliabilities by Rank and Command

	TRADOC				FORSCOM			COMBINED			
	NCO	OFF	CIV	TOT	NCO	OFF	TOT	NCO	OFF	CIV	TOT
N[a]	11	7	4	11	10	9	10	11	9	4	11
Frequency	.55	.55	.49	.54	.57	.58	.56	.55	.57	.48	.55
N[a]	11	7	4	11	10	9	10	11	9	4	11
CTI	.52	.49	.44	.49	.52	.54	.52	.52	.52	.43	.50
GSI	.51	.53	.43	.49	.54	.56	.54	.52	.55	.42	.52
OJI	.53	.52	.43	.51	.56	.57	.56	.54	.55	.42	.53
N[a]	11	7	4	11	10	9	10	11	9	4	11
Difficulty	.39	.38	.38	.38	.43	.45	.43	.41	.43	.37	.41
N[a]	55	35	20	55	50	45	50	55	45	20	55
All Scales	.50	.50	.43	.48	.52	.54	.52	.51	.52	.42	.50
N[a]	44	28	16	44	40	36	40	44	36	16	44
Frequency & Importance	.53	.52	.45	.51	.55	.56	.54	.53	.55	.44	.52

Note. CTI = Core Technical Importance, GSI = General Soldiering Importance, OJI = Overall Job Importance.

[a]Number of reliability coefficients included in the analyses.

differences, the magnitude of the reliability differences among scales or among rater groups is not large. In addition, reliability information is not a sufficient determining factor in selecting scales or rater groups for use in developing synthetic validation. There are other issues to consider.

Agreement among rater groups. Table 3.5 also provides some evidence for the agreement among rater groups. That is, if the different groups are providing different mean task category ratings, then reliabilities estimated across groups will be lower than the separate reliabilities estimated for each rater group. For example, NCO and Officer reliabilities average slightly higher than total group reliabilities. In theory, a more powerful way to test group differences in the task category ratings is by repeated measures ANOVA on the raters with their task category ratings as the repeated "trials" and rank and command as grouping factors. The number of trials (96 task category ratings per scale), however, is excessive. An alternative approach, with two parts, was used. Each part was

relevant tasks. This difference may not be trivial. If NCOs, compared to Officers, are identifying a larger set of task categories as relevant to their MOS, then there is a possibility that the NCO profiles will lead to the selection of a larger set of predictors for the MOS. Another difference is that civilians provide lower average ratings than either NCOs or Officers on all scales except Difficulty. Also, command differences occur for Frequency, Overall Job Importance, and Difficulty. In each case TRADOC ratings average higher than FORSCOM ratings.

Examination of proportions of non-zero ratings was conducted by converting rating group mean profiles to profiles of 1s and 0s. Group means of 0.0 for task categories occur only when all raters within a group rate the item as zero. Rather than strictly using these means, task categories with mean ratings of less than 1.0 were recoded as zero. Task categories with mean ratings equal to or greater than 1.0 were recoded as 1. The selection of 1 as the cutoff point means either that all raters agree that the task category has some frequency or importance, or that a sufficient number of raters believe a task category is of more than minor importance (ratings of 2.0 or more) to offset the opinions of those that believe the category is not part of the MOS. Tables 3.9 and 3.10 present analyses using only NCOs and Officers.

Table 3.6

Mean Level of Army Task Questionnaire Ratings for Five Rater Groups

	Rater Group				
	NCO		Officer		Civilian
Scale	TRADOC	FORSCOM	TRADOC	FORSCOM	TRADOC
N of raters	672	672	672	672	288
Frequency	1.510	1.470	1.466	1.420	1.175
Core Tech Imp	1.676	1.653	1.571	1.537	1.295
Gen Soldier Imp	1.703	1.656	1.604	1.586	1.310
Overall Job Imp	1.811	1.740	1.721	1.695	1.452
Difficulty	1.621	1.480	1.764	1.609	1.482

Table 3.7

Rank and Command Effects on Army Task Questionnaire Ratings

Dependent Variable	Within-Subjects	SS	df	MS	*F*	*p*
Frequency	Rank (R)	1.498	1	1.498	10.053	0.002
	Error	100.016	671	0.149		
	Command (C)	1.231	1	1.231	6.280	0.012
	Error	131.572	671	0.196		
	R X C	0.008	1	0.008	0.072	0.788
	Error	71.967	671	0.107		
Core Tech Imp	Rank (R)	8.269	1	8.269	31.468	0.000
	Error	176.314	671	0.263		
	Command (C)	0.556	1	0.556	2.108	0.147
	Error	177.078	671	0.264		
	R X C	0.017	1	0.017	0.141	0.707
	Error	82.628	671	0.123		
Gen Soldier Imp	Rank (R)	4.795	1	4.795	26.449	0.000
	Error	121.656	671	0.181		
	Command (C)	0.710	1	0.710	3.486	0.062
	Error	136.680	671	0.204		
	R X C	0.135	1	0.135	1.024	0.312
	Error	88.455	671	0.132		
Overall Job Imp	Rank (R)	3.049	1	3.049	16.214	0.000
	Error	126.166	671	0.188		
	Command (C)	1.582	1	1.582	7.397	0.007
	Error	143.506	671	0.214		
	R X C	0.348	1	0.348	2.625	0.106
	Error	89.069	671	0.133		
Difficulty	Rank (R)	12.475	1	12.475	66.428	0.000
	Error	126.011	671	0.188		
	Command (C)	14.719	1	14.719	71.250	0.000
	Error	138.612	671	0.207		
	R X C	0.031	1	0.031	0.267	0.606
	Error	78.992	671	0.118		

Table 3.8

Civilian Versus Soldier Effects on Army Task Questionnaire Ratings

Dependent Variable	Within-Subjects Effects	SS	df	MS	F	p
Frequency	Civilian	11.644	1	11.644	41.037	0.000
	Error	81.432	287	0.284		
Core Tech Imp	Civilian	12.600	1	12.600	34.517	0.000
	Error	104.770	287	0.365		
Gen Soldier Imp	Civilian	23.586	1	23.586	64.722	0.000
	Error	104.590	287	0.364		
Overall Job Imp	Civilian	14.562	1	14.562	35.057	0.000
	Error	119.213	287	0.415		
Difficulty	Civilian	1.430	1	1.430	3.441	0.065
	Error	119.251	287	0.416		

Table 3.9

Proportion of Non-zero Rated Task Categories for Four Rater Groups

	Rater Group			
	NCO		Officer	
Scale	TRADOC	FORSCOM	TRADOC	FORSCOM
N of raters	672	672	672	672
Frequency	0.542	0.516	0.554	0.527
Core Technical Importance	0.579	0.554	0.568	0.557
General Soldier Importance	0.579	0.551	0.576	0.561
Overall Job Importance	0.594	0.564	0.612	0.585
Difficulty	0.635	0.577	0.680	0.631

Table 3.10

Rank and Command Effects on Proportion of Non-zero Rated Task Categories

Dependent Variable	Within-Subjects	SS	df	MS	*F*	*p*
Frequency	Rank (R)	0.084	1	0.084	1.472	0.226
	Error	38.166	671	0.057		
	Command (C)	0.456	1	0.456	7.496	0.006
	Error	40.794	671	0.061		
	R X C	0.000	1	0.000	0.010	0.919
	Error	24.250	671	0.036		
Core Tech Imp	Rank (R)	0.009	1	0.009	0.141	0.707
	Error	44.241	671	0.066		
	Command (C)	0.233	1	0.233	3.999	0.046
	Error	39.017	671	0.058		
	R X C	0.030	1	0.030	0.717	0.398
	Error	28.220	671	0.042		
Gen Soldier Imp	Rank (R)	0.009	1	0.009	0.148	0.701
	Error	42.241	671	0.063		
	Command (C)	0.313	1	0.313	6.009	0.014
	Error	34.937	671	0.052		
	R X C	0.030	1	0.030	0.692	0.406
	Error	29.220	671	0.044		
Overall Job Imp	Rank (R)	0.251	1	0.251	4.470	0.035
	Error	37.749	671	0.056		
	Command (C)	0.537	1	0.537	9.372	0.002
	Error	38.463	671	0.057		
	R X C	0.001	1	0.001	0.034	0.853
	Error	28.999	671	0.043		
Difficulty	Rank (R)	1.621	1	1.621	22.950	0.000
	Error	47.379	671	0.071		
	Command (C)	1.929	1	1.929	30.045	0.000
	Error	43.071	671	0.064		
	R X C	0.013	1	0.013	0.300	0.584
	Error	29.987	671	0.045		

The comparisons of proportions of task categories with non-zero ratings for Frequency, Core Technical Importance, and General Soldiering Importance are not statistically different for NCOs and Officers. This suggests that the difference in mean levels of these rater group profiles are due to higher ratings given to relevant (non-zero) task categories by NCOs rather than NCOs identifying a greater number of relevant task categories. On the other hand, rank differences are significant for proportions of task categories given non-zero Overall Job

Importance and Difficulty ratings. This suggest that the mean differences in profiles may be due, at least in part, to more task categories being rated in those areas.

Other subtle differences may be disentangled from these results. However, the sizes of the mean differences that are statistically significant are not particularly large (e.g., command mean differences on Frequency are .05). Furthermore, the statistical posture of these analyses is directed toward highlighting differences rather than similarities. The final analysis of the mean profiles highlights the similarities among the rater groups.

Table 3.11 presents the correlations between the rater group profiles. Excluding the civilians, these correlations average in the upper .80s to lower .90s. While the correlations are high, they are not perfect. These correlations, viewed in light of the profile level analyses, suggest that every group profile may be considered highly similar to the other group profiles, but each also offers some unique variance in task category ratings. Recall that these group profiles are highly reliable so it is difficult to dismiss the unique information as unreliable noise.

Conclusions Concerning Army Task Questionnaire Reliability

As in Phases I and II, the Army Task Questionnaire continues to produce high reliability both within and across the different rater groups. Phase III analyses extended the previous analyses to more thoroughly investigate the differences between rater groups. Small, but statistically identifiable, differences in ratings from the different rater groups were found. It has been the opinion throughout this project that psychometrics alone cannot determine who to use for MOS raters. Which group or combination of groups represents or should represent the "true" MOS profile is a political question. The data do suggest that careful consideration should be given before using civilians; their perspective is the most divergent, and the constituency they represent may be the least certain. For some MOS, the identification of appropriate Officers was a problem, suggesting the Officer group should not be automatically included in obtaining MOS data. On the other hand, there should be no question about the inclusion of NCOs. They represent the senior leadership in the MOS, and they are actively involved with MOS development at the schools. The psychometric differences for command, coupled with the political perspective, suggest that ratings obtained from TRADOC and from a sample of operational units may be the most acceptable. Considering the Phase II synthetic equation discriminate validities and foreshadowing the Phase III results presented in the next chapter, the sample of raters should be large enough to provide as much of the discrimination potential available from the Army Task Questionnaire as reasonably feasible. For example, a sample of 20 TRADOC raters and 40 raters from operational units from at least two sites would give a total of 60 raters. Sixty raters

Table 3.11

Correlations Among Rater Group's Army Task Questionnaire Profile

	TRADOC NCO	FORSCOM NCO	TRADOC Officers	FORSCOM Officers	Matrix mean r w/civilians (w/o civilians)
Frequency Scale:					
FORSCOM NCOs	0.925				
TRADOC Officers	0.905	0.903			.89
FORSCOM Officers	0.895	0.945	0.900		(.93)
TRADOC Civilians	0.854	0.854	0.861	0.840	
Core Technical Importance Scale:					
FORSCOM NCOs	0.928				
TRADOC Officers	0.870	0.874			.87
FORSCOM Officers	0.876	0.935	0.885		(.89)
TRADOC Civilians	0.839	0.841	0.853	0.834	
General Soldiering Importance Scale:					
FORSCOM NCOs	0.926				
TRADOC Officers	0.892	0.920			.84
FORSCOM Officers	0.901	0.948	0.916		(.92)
TRADOC Civilians	0.867	0.865	0.835	0.836	
Overall Job Importance Scale:					
FORSCOM NCOs	0.931				
TRADOC Officers	0.897	0.920			.89
FORSCOM Officers	0.900	0.950	0.909		(.92)
TRADOC Civilians	0.863	0.853	0.826	0.837	
Difficulty Scale:					
FORSCOM NCOs	0.895				
TRADOC Officers	0.851	0.878			.85
FORSCOM Officers	0.842	0.921	0.872		(.88)
TRADOC Civilians	0.798	0.839	0.780	0.809	
N of raters:					
TRADOC NCOs	1056				
FORSCOM NCOs	960	960			
TRADOC Officers	672	672	672		
FORSCOM Officers	864	864	672	864	
TRADOC Civilians	384	384	288	384	384

would yield mean Core Technical Importance ratings with a reliability of .98 given the single-rater reliability estimates of .50 in Table 3.5.

Army Task Questionnaire Scale Validities

Phase II showed that the Army Task Questionnaire scales are highly redundant, but that the scales do show some degree of discrimination among the MOS. These conclusions stemmed from analyses of a multitrait-multimethod correlation matrix computed from task category rating profiles for each MOS on each scale. That is, the 10 Phase I and II MOS represented different traits, and the four rating scales represented different assessment methods. The 96 Army Task Questionnaire items represented cases from which the multitrait-multimethod matrix was constructed. For Phase III, this procedure was repeated using the 11 Phase III MOS as traits and the five scales as methods. Appendix C presents the full multitrait-multimethod matrix. Summary results are presented below.

Discrimination Among MOS

Discriminant validities are the correlations across questionnaire task categories between different MOS assessed by the same rating scale. Table 3.12 shows the average (*r* to *z*) of these correlations for each rating scale. Phase I and II results are displayed for comparison.

Phase III results are congruent with previous results. The discriminant validity correlations replicated on 11 different MOS are virtually identical to those based on the 10 Phase I and II MOS. As expected, the Core Technical Importance scale, having

Table 3.12

Mean Discriminant Validity (Same Scale, Different MOS) Correlations

Scale	Phase III MOS		Phase I and II MOS	
	r	$1-r^2$	r	$1-r^2$
Frequency	.63	.60	.63	.60
Core Technical Importance	.58	.66	.58	.66
General Soldier Importance	.88	.23	.86	.26
Overall Job Importance	.75	.43	.75	.44
Difficulty	.68	.54	-	-

the lowest average discriminant correlations, shows the greatest discrimination among the MOS, and the General Soldiering Importance scale shows the least discrimination. It is interesting that the two scales that address the relevance of the task categories to the whole job (i.e., the Frequency and Overall Job Importance scales) are quite different in the extent to which they discriminate among the MOS.

While these correlations look high, suggesting that all MOS appear rather similar on the Army Task Questionnaire, there is an alternative way to present the data. For example, the Core Technical average discriminant validity of .58 may be interpreted to mean that any MOS shares, on the average, 34% of its variance in task category ratings with any other MOS. That leaves 66% of the MOS variance in task category ratings as unique. Again, the task category ratings are highly reliable, suggesting that the 66% unique variation in task category ratings may be meaningful. On the other hand, the discriminant validity correlations for General Soldiering Importance ratings suggest that no more than 23% of the variation in task category ratings is MOS-specific.

Convergence of Rating Scales

Convergent validities are the correlations across task category means of the different rating scales within each MOS. These are presented in Table 3.13 for Phase III MOS as well as for the 10 MOS analyzed in Phases I and II. The pattern of results from the Phase III MOS again parallel previous results. The Frequency, Core Technical Importance, and Overall Job Importance scales are essentially redundant. The General Soldiering Importance scale shows somewhat less redundancy with the other scales.

A second source of information concerning the redundancy of the rating scales comes from the average off-diagonal (different scale, different MOS) correlations presented in Table 3.14. As noted in the Phase II report, the normal expectation is that these correlations will not be high. However, they are in the same range as the discriminant validity correlations presented in Table 3.12. This again suggests that the different scales are providing the same information about the MOS.

An issue concerning the Army Task Questionnaire rating scales is that their correlations are inflated by the multiple zero ratings that MOS are expected to have in common. The convergent and discriminant validity correlations for the 11 Phase III MOS were repeated with the previously described index of 1s and 0s presenting a dichotomy of relevant versus non-relevant tasks. Tables 3.15 and 3.16 present these recalculated validities along with the original validities presented in Tables 3.12 and 3.13. With the exception of the discriminant validities for the General Soldiering Importance scale, the convergent and discriminant validities for the recoded task category profiles show little, if any, difference from those for the task category

means. The Phase II report suggested that it may not matter so much how frequently performed or how important a task category is, but simply that it is relevant to the job. That conclusion is reinforced with the present observations.

Table 3.13

Mean Convergent Validities (Different Scale, Same MOS) Correlations

	Freq	Core Tech Imp	Gen Sold Imp	Over Job Imp
Core Technical Importance				
Phase III	.99			
Phases I & II	.99			
General Soldier Importance				
Phase III	.91	.90		
Phases I & II	.91	.89		
Overall Job Importance				
Phase III	.97	.97	.97	
Phases I & II	.97	.96	.98	
Difficulty				
Phase III	.93	.94	.92	.97

Table 3.14

Mean Off-Diagonal (Different Scale, Different MOS) Correlations

	Freq	Core Tech Imp	Gen Sold Imp	Over Job Imp
Core Technical Importance				
Phase III	.59			
Phase II	.60			
General Soldier Importance				
Phase III	.73	.69		
Phase II	.70	.68		
Overall Job Importance				
Phase III	.67	.65	.81	
Phase II	.68	.65	.80	
Difficulty				
Phase III	.61	.59	.74	.69

Table 3.15

Mean Convergent Validities (Different Scale, Same MOS) Correlations Based on Relevant (1) versus Non-relevant (0) Indices and Original Mean Ratings

	Freq	Core Tech Imp	Gen Sold Imp	Over Job Imp
Core Technical Importance				
1/0 Scoring	.96			
Task Means	.98			
General Soldier Importance				
1/0 Scoring	.90	.89		
Task Means	.89	.87		
Overall Job Importance				
1/0 Scoring	.89	.96	.94	
Task Means	.97	.96	.97	
Difficulty				
1/0 Scoring	.84	.88	.94	.93
Task Means	.93	.94	.91	.96

Table 3.16

Mean Discriminant Validity (Same Scale, Different MOS) Correlations Based on Relevant (1) versus Non-relevant (0) Indices and Original Meaning Ratings

Scale	1/0 Scoring		Task Mean Ratings	
	r	$1-r^2$	r	$1-r^2$
Frequency	.59	.65	.63	.60
Core Technical Importance	.56	.69	.58	.66
General Soldier Importance	.69	.52	.88	.23
Overall Job Importance	.66	.59	.75	.43
Difficulty	.64	.59	.68	.54

Conclusions

Three important conclusions may be reached regarding the Army Task Questionnaire. First, it provides highly reliable descriptions of Army MOS. In fact, using the worst case reliability (.40 single-rater reliability for 55B Core Technical Importance), only 14 raters would be needed to boost the reliability of mean ratings to .90. Thus, we reiterate that political concerns regarding the extent to which raters represent all of the important constituencies should drive decisions about the number of raters to use in future synthetic validity efforts. Second, the Army Task Questionnaire, particularly Core Technical Importance, differentiates the MOS. Third, Frequency, Core Technical Importance, and Overall Job Importance are highly redundant. They basically provide information about whether or not a task category is relevant to the MOS. General Soldiering Importance is the least redundant of the scales and, reflecting the structure of a common set of tasks for all Army MOS, shows the least discrimination among the MOS.

Table 3.17 presents summary descriptions of all MOS from Phases I, II, and III of the Synthetic Validity project. The table indicates which Task Dimensions from the Army Task Questionnaire are of major relevance to the Core Technical component for each MOS. A dimension was defined as relevant for an MOS if at least one of the dimension's constituent task categories had a Core Technical Importance value of 3.5 or greater. Using the relevance definition, MOS were sorted for visual presentation by a matrix cluster routine (Wilkinson, 1988) that simultaneously orders rows (MOS) and columns (Task Dimensions). The numbers inside the matrix cells indicate the number of task categories with a mean Core Technical Importance value greater than or equal to 3.5. Clustering of MOS is pursued more closely in the following chapter.

The data in Table 3.17 render no significant deviations from what one would intuitively expect. Because communication is important for performance in any job, military or civilian, it is not surprising that Communication is a relevant dimension for all MOS studied. Also, it is apparent that while all MOS endorse the Communication Dimension as important, they differ in terms of the number of relevant task categories within the dimension. Returning to Table 3.3, the highlighted task categories within Communication show a pattern consistent with the relative characteristics of the MOS.

As expected, Dimension M (Combat) is relevant for combat MOS, Dimension B (Electrical and Electronic Maintenance) is relevant for MOS that repair electrical and electronic systems, and Dimension H (Clerical) is relevant for MOS that must maintain records or accounts and/or perform general office work. Note that Dimension L (Air Traffic Control) is not relevant for any MOS because none of the MOS studied are even remotely involved in controlling air traffic. At first glance, it may seem surprising

that the Combat Dimension did not appear relevant to all MOS. However, because Core Technical Importance ratings were used to define dimension relevance, one might expect combat to be a less significant part of the MOS-specific aspect of most of the MOS studied.

Table 3.17

Task Dimensions with Major Relevance to Phase I, II, and III MOS

MOS	Task Dimension																
	I	D	A	M	N	P	O	G	J	C	K	L	E	H	Q	B	F
95B Military Police	6[a]	1	2	8			1	1							3		
11B Infantryman	5		2	7	1	1	1	1									
19K Armor Crewman	5	1	2	4	3	1	1										
16S MANPADS Crewman	4	1	2	5		1											
88M Motor Transport Operat	2	1	1	1						1							
12B Combat Engineer	3	1	2	6	1												
13B Cannon Crewman	2	1	2	3	4												
54B Chemical Ops Specialist	3	1	1	1													1
31D Mobile Radio Operator	3	1	1										1		3	1	1
27E TOW/Dragon Repair	1	1	3												1	5	1
63B Light Vehicle Repairer	1	1	2													1	
31C Single Channel Radio Op	3	1	1						1					1		1	2
29E Radio Repairer	1															5	1
94B Food Service Specialist	1																1
91A Medical Specialist	1						1										1
51B Carpentry/Masonry Spec	1												2				
71L Admin Specialist	1													3			
76Y Unit Supply Specialist	1								1					4			
67N Utility Helicopter Rep	1		3											1	1		
55B Ammunition Specialist	1	1								1				1			
96B Intelligence Analyst	6							1	1						1		

Note. Task dimensions are:

I = Communication
D = Vehicle and Equipment Operations
A = Mechanical Maintenance
M = Individual Combat
N = Crew-served Weapons
P = Identify Targets
O = First Aid
G = Technical Drawings
J = Analyze Information
C = Pack and Load
K = Math and Data
L = Air Traffic Control
E = Construct/Assemble
H = Clerical
Q = Supervision
B = Electrical and Electronic Maintenance
F = Technical Procedures

[a]Number of task categories, within the dimension, judged relevant to the MOS.

By the nature of the definition, Core Technical Importance ratings describe the unique characteristics of an MOS. On the other hand, Frequency and Overall Job Importance, because they are highly related to both the General Soldiering and Core Technical job components, may be better overall descriptors. Indeed, if the mean convergent validities presented in Table 3.13

are entered into the Multiple R formula for two predictors, the result shows that Core Technical Importance and General Soldiering Importance may be combined to account for 99.6% of the variance in the Overall Job Importance ratings. The following chapter examines both Core Technical Importance ratings and Overall Job Importance ratings as bases for the development of synthetic predictor equations.

Chapter 4: Formation of Job Performance Prediction Equations and Evaluation of Their Validity

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In this chapter we describe the formation of prediction equations using the ratings collected with the Army Task Questionnaires, ratings of the validity of a set of predictor constructs for the task categories (collected earlier in the project; see Peterson, Owens-Kurtz, Hoffman, Arabian, & Whetzel, 1990), and empirical estimates of the correlations of measures of the predictor constructs. We report and evaluate the results when those equations are applied to data from samples for 18 MOS collected as part of Project A. We compare results from the application of the synthetic methodology to results from the application of the more traditional validity generalization methodology.

Before proceeding with the details of the methods and computations, we provide a more general overview of the elements that go into the synthetic validity methodology developed for this project. Figure 4.1 shows the elements of the synthetic models that we describe in this chapter. Starting at the left side of the figure, note that **attribute items are tied to job descriptor components or items (task category items)[1] by ratings of the validity of each attribute *for predicting performance* on each of the descriptor items.** Note also that these validity ratings are made **by psychologists.** Thus, the attributes are here cast clearly as predictors of very discrete and relatively small pieces of Army jobs. We refer to weights obtained from these ratings as "attribute-by-component" weights.

Moving across the figure to the right, note next that the **task category items are tied to a specific MOS by officers/NCOs who make ratings of the frequency, importance, and difficulty of each item with respect to a particular MOS.** Note also that these ratings may be made with regard to overall performance or for slightly more specific parts of MOS job performance, such as Core Technical or General Soldiering Proficiency. Weights obtained from these kinds of ratings are referred to as "component-by-job" or "criticality" weights.

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[1]In an earlier phase of this project, other types of job descriptor items were used: job activity items and a "hybrid" item type that combined the task category and job activity types. Analyses of data from earlier phases indicated that the task category item type seemed most acceptable to SMEs, provided the most reliable ratings, and led to the highest levels of validity when used in synthetic equations.

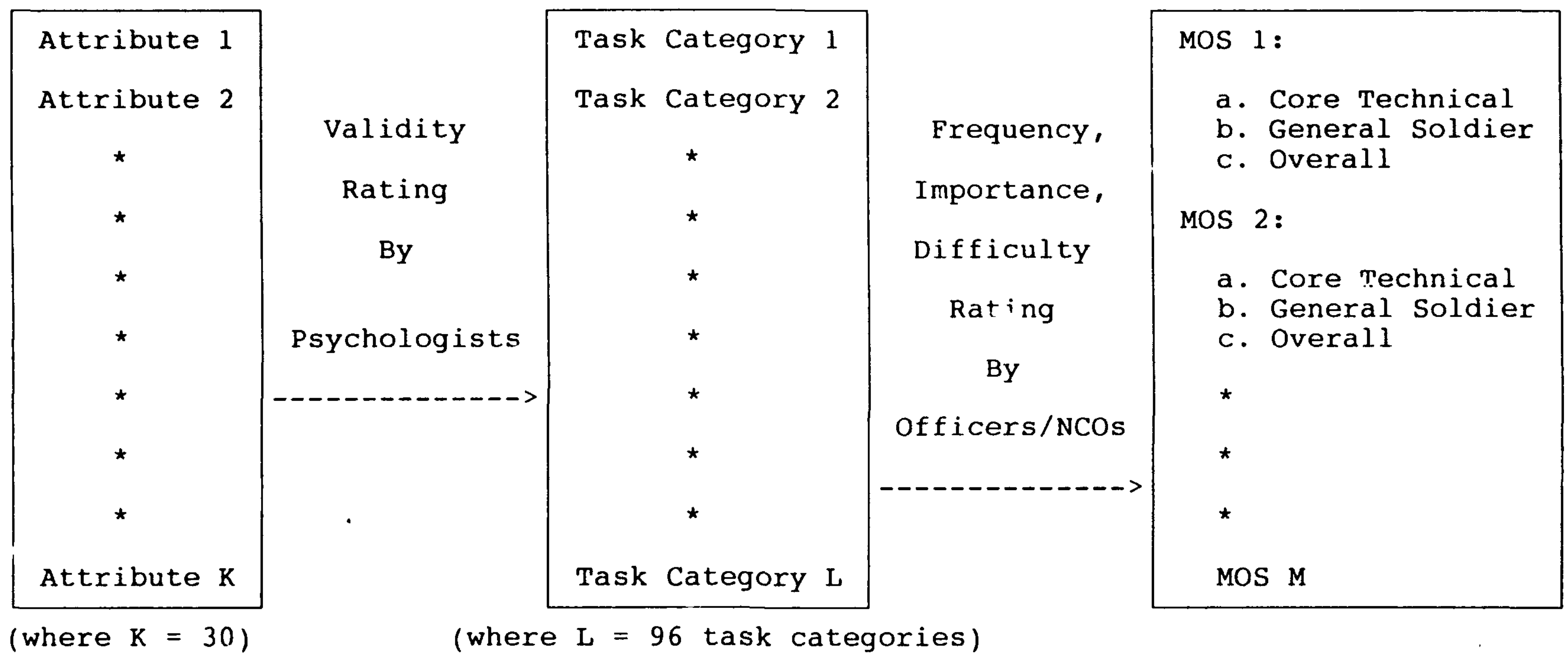


Figure 4.1. Elements of synthetic validity models.

Formation of Equations and Evaluation of Their Validity

As in the evaluations of synthetic equations derived for earlier phases of this project (Wise, Peterson, Rosse, & Campbell, 1989; Oppler, Peterson, & Wise, 1990), the present evaluations focus on two general criteria--absolute and discriminant validity. Absolute validity refers to the degree to which the synthetic equations are able to predict performance in the specific jobs for which they were developed. For example, how well does a particular synthetic equation derived for soldiers in 19K predict Core Technical Proficiency in that MOS? Data from Project A were used to obtain empirical estimates of these validities. The second criterion, discriminant validity, refers to the degree to which performance in each job is better predicted by the synthetic equation developed specifically for that job, than by the synthetic equations developed for the other MOS. For instance, how much better can the synthetic equation developed for 19K predict Core Technical Proficiency in that MOS than the synthetic equations developed to predict Core Technical Proficiency in each of the other MOS? Empirical estimates of correlations relevant to this criterion were also derived from data collected in Project A.

The synthetic equations whose absolute and discriminant validities are reported here were based on the job component model described above. The equations required two different sets of weights, attribute-by-component (for predicting MOS performance at the individual component level) and component-by-job (for weighting the individual component prediction equations to form an overall prediction equation).

We examined the degree to which the absolute and discriminant validities of the synthetic equations depend on the particular methods (described below) by which these sets of weights are formulated.

Predictor Measure and Job Performance Data

The predictor measure and job performance data used in these analyses were taken from the Project A Concurrent Validation (CV) data base. The overall data set included predictor and job performance measures collected on soldiers in 19 different jobs. Eighteen of these jobs or Military Occupational Specialties (MOS) were included in either Phase I, II, or III of this project. We used all 18 MOS to evaluate the validity of the synthetic equations. Table 4.1 shows the designations and names of these MOS, as well as the phase in which they were included and their CV sample size.

The individual predictor measures included in the Project A battery have been described in detail by Peterson, Hough, et al. (1990). Owens-Kurtz and Peterson (1989) have described the identification of specific measures in the Project A data set

corresponding to 26 of the 30 items in the Synthetic Validity Project's attribute taxonomy. These 26 measures were used in the analyses reported here. (Thus, validity ratings were not used for the four attributes not associated with Project A measures.)

Wise, Campbell, McHenry, and Hanser (1986), and Campbell, McHenry, and Wise (1990), have described the identification and measurement of five job performance constructs of interest to the Army: job-specific proficiency (called "Core Technical Proficiency or CTP"), general soldiering proficiency, effort and leadership, personal discipline, and physical fitness and military bearing. For the synthetic validation analyses reported here we chose to use the job-specific proficiency measures, plus an overall performance measure that is a weighted combination of

Table 4.1

MOS Included in Synthetic Validity Investigations Phase of Project, and Sample Size for Project A Concurrent Validation Data

MOS	Label	SV Phase	CV Sample Size
11B	Infantryman	1	491
12B	Combat Engineer	3	544
13B	Cannon Crewman	3	464
16S	MANPADS Crewman	2	338
19K	Armor Crewman	2	394
27E	Tow/Dragon Repairer	3	123
29E*	Radio Repairer	3	---
31C	Single Channel Radio Operator	3	289
31D*	Mobile Subscriber Equipment Transmission System Operator	3	---
51B	Carpentry and Masonry Specialist	3	69
54B	Chemical Operations Specialist	3	340
55B	Ammunition Specialist	3	203
63B	Light Wheel Vehicle Mechanic	1	478
67N	Utility Helicopter Repairer	2	238
71L	Administrative Specialist	1	427
76Y	Unit Supply Specialist	2	444
88M	Motor Transport Operator	2	507
91A	Medical Specialist	2	392
94B	Food Service Specialist	2	368
95B	Military Police	3	597
96B*	Intelligence Analyst	3	---

*No Project A Concurrent Validation data available.

all five construct measures (Sadacca, Campbell, White, & DiFazio, 1989). (The job-specific measures were composed of items from written tests of job knowledge and hands-on work samples.) The decision to use these two measures was made for three reasons. First, and primarily, the Synthetic Validity Project is most closely focused on the development of prediction composites for job-specific aspects of performance. Second, Wise, McHenry, and Campbell (1990) showed that the same predictor measures are optimal for a wide range of jobs in predicting all but job-specific proficiency. Significant differences across jobs were found in the predictors of job-specific proficiency. Thus, it appears that discriminant validity could not be legitimately expected for any other criterion measure. These first two reasons argue strongly for the inclusion of the Core Technical Proficiency construct as a separate criterion, but none of the other four separately. However, thirdly, it is of scientific and practical interest to determine the validity of the synthetic methodology for predicting Overall Job Performance, in particular if Overall Performance is less well predicted than Core Technical Proficiency.

As noted earlier, the number of soldiers with complete data on the predictor and criterion measures in the Concurrent Validation samples corresponding to the Synthetic Validity Project MOS are reported in Table 4.1. These samples differed somewhat in terms of the heterogeneity and mean levels of the predictor scores. Also, because all were selected job incumbents, they had higher and less variable predictor scores in comparison to the overall pool from which applicants are drawn. Common practice has been to use a multivariate correction to adjust covariances and correlations for differences in heterogeneity (Lord & Novick, 1968). This procedure corrects for effects of restriction in range due to explicit selection on the subtests of the ASVAB and incidental selection on other Project A predictors. A second correction was made for self-selection into each occupational specialty and attrition after initial enlistment.

We used a two-step procedure to adjust for range restriction due to both sources of selection. The 1980 Youth Population sample to which the Armed Services Vocational Aptitude Battery (ASVAB) was administered is used as the target population. First, we computed the covariance of the 26 predictor measures (corresponding to the attributes) for each of the 18 MOS-specific samples and adjusted these covariances for differences between the samples and the Youth Population in the covariances of the ASVAB subtests.[2] This provided us with estimates of the

[2]We initially used a different, less traditional method of estimating the population predictor intercorrelation matrix. However, follow-up simulation analyses convinced us that the more traditional method was best. See the Addendum to this report for a full description of the investigation of this matter.

covariances among the attribute measures for the Youth Population, had all of the Project A predictor measures been administered to them. (Assumptions underlying these estimates are described in Lord and Novick, 1968.)

Second, we computed covariances for each of the 18 job-specific samples that included 26 predictors plus the Core Technical and Overall Performance criterion construct scores. We then adjusted these covariances for differences between the job specific sample and the estimated Youth Population covariances. These corrections provided estimates of the covariances among the 26 predictors and Core Technical and Overall Performance in each of the 18 MOS for the 1980 Youth Population.

Table 4.2 shows the means and standard deviations of the predictor measures in the total CV sample. The means and standard deviations for each of the attribute measures in the samples for each of the 18 Synthetic Validity MOS are not shown here in the interest of conserving space, but are given in Appendix D of this report. The estimated standard deviations for the Youth Population are also shown in Table 4.2. (The means for the Youth Population are not used in the following analyses and so were not estimated.)

Method of Forming Equations

Once the covariances of the predictor and criterion measures are estimated for each job, validities for any given composite of the predictors can be estimated through relatively direct matrix manipulations. For the equations reported here, there are two steps in forming a synthetic predictor score composite. First, scores on individual Project A measures of the attributes are standardized, weighted (by the psychologists' ratings of validities), and summed to form a predicted score for each job component. Second, these predicted job component scores are then weighted (according to job description ratings by the officers/NCOs) and summed to form the predicted total job performance score.

We developed several methods of forming equations using the basic steps outlined just above. These methods varied according to the criterion being predicted, the method of forming the attribute by component weights, the method of forming the component by job weights, and the techniques used to directly "reduce" the number of predictor measures included in the final equation. We turn now to a description of these variations.

The criterion predicted. As noted earlier, we were interested in the extent to which the synthetic methodology could provide prediction equations for both Core Technical and Overall Performance. Scores on both criteria were available from the Project A data base, so it was possible to evaluate the validity of both types of equations. In terms of developing the synthetic equations, only the component by job weights are affected. (The

Table 4.2

Means and Standard Deviations for 9 ASVAB Subtests and 26 Attribute Measures: Project A Total CV Sample

Measure	N	All MOS Mean	Std Dev	1980 Population Std Dev
ASVAB Subtests				
GS: General Science	7045	51.40	8.13	10.00
AR: Arithmetic Reasoning	7045	52.87	7.28	10.00
VE: Verbal	7045	50.96	6.44	10.00
NO: Numeric Operations	7045	52.71	6.38	10.00
CS: Coding Speed	7045	51.28	6.68	10.00
AS: Auto/Shop Information	7045	54.14	8.53	10.00
MK: Mathematics Knowledge	7045	50.98	7.39	10.00
MC: Mechanical Comprehension	7045	53.11	8.17	10.00
EI: Electronics Information	7045	52.14	7.55	10.00
Attribute Measures				
Verbal Ability	7045	102.37	13.51	18.97
Reasoning	7045	102.44	16.46	19.27
Number Ability	7045	100.00	17.40	25.35
Spatial Ability	7045	100.00	17.43	21.18
Mental Information Processing	7045	100.00	23.59	24.71
Perceptual Speed & Accuracy	7045	100.00	17.64	20.43
Memory	7045	50.00	14.22	14.95
Mechanical Comprehension	7045	133.33	17.63	22.85
Eye-Limb Coordination	7045	0	14.01	14.78
Precision	7045	0	18.84	20.39
Movement Judgment	7045	6.62	9.00	9.38
Hand & Finger Dexterity	7045	16.73	7.76	7.86
Involvement in Athletics	7045	13.90	3.06	3.07
Work Orientation	7045	150.00	26.12	26.76
Cooperation/Stability	7045	150.00	26.40	26.94
Energy	7045	48.43	5.99	6.09
Conscientiousness	7045	102.48	16.52	16.66
Dominance/Confidence	7045	100.00	18.12	18.92
Interest in Using Tools	7045	200.00	32.93	34.79
Interest in Rugged Activities	7045	150.00	26.01	26.46
Interest in Protective Services	7045	100.00	17.03	17.20
Interest in Technical Activities	7045	150.00	23.55	23.57
Interest in Science	7045	200.00	29.23	29.51
Interest in Leadership	7045	40.07	8.45	8.59
Interest in Artistic Activities	7045	14.13	4.10	4.16
Interest in Efficiency & Organization	7045	200.00	29.95	30.71

attribute by component weights are not affected since they are derived from judgments made by psychologists about the validity of an attribute for performance on a discrete job component, i.e., a particular task category.) Recall from Chapter 3 that the Army SMEs provided judgments about the importance of task categories for Core Technical, General Soldiering, and Overall

Performance. Therefore, when the object of prediction was Core Technical Proficiency, the task category importance judgments for Core Technical Proficiency were used, and when the object of prediction was Overall Performance, the task category importance judgments for Overall Performance were used.

Attribute-by-component weights. Three different methods were used to form the attribute-by-component weights. One method for developing prediction equations for each job component used attribute weights that were directly proportional to the attribute-by-component validities estimated by psychologists. This was called the validity method. A second alternative was to use zero or one weights (called the 0-1 attribute weight method). In this alternative, all attributes with mean validity ratings for a component less than 3.5 (corresponding to a validity coefficient of .30) were given a weight of 0 and all remaining attributes were given a weight of 1. A third alternative was identical to the zero-one weight, except that when a mean validity rating was 3.5 or greater, the weight given was proportional (as in the first method) rather than set to 1. This was called the 0-mean attribute weight method.

Component-by-job or "criticality" weights. With regard to these "criticality" weights, we were primarily interested in two topics. First, results in prior phases showed that the use of cutoffs or thresholds on criticality weights (that is, setting lower weights to zero) produced higher discriminant validities without sacrificing much absolute validity. Second, we were interested in the extent to which the grouping of similar MOS into clusters might produce synthetic equations with higher absolute or discriminant validities than those produced by MOS-specific equations. Therefore, we used four types of criticality weights. These weights were based on the mean task importance ratings (for Core Technical or Overall Performance, as appropriate; see The Criterion Predicted section above) computed for an MOS or for a cluster of MOS. Specifically, they were:

1. Mean importance ratings computed across all SMEs for an MOS, dubbed "MOS Mean Component Weights."

2. Mean importance ratings computed across all SMEs for an MOS transformed such that means < 3.5 were set to zero, and means above 3.5 were left as is, dubbed "MOS Threshold Component Weights."

3. Mean of "MOS mean" importance ratings for MOS that were similar in terms of their mean task importance profiles [determined by performing a Ward & Hook (Wilkinson, 1988) clustering of all MOS based on the appropriate profiles; see below], dubbed "Cluster Mean Component Weights."

4. Transformed "Cluster Mean" ratings, using the same cutoff criteria (set to zero if < 3.5), dubbed "Cluster Threshold Component Weights."

We clustered the MOS by correlating their mean task category importance profiles (their mean scores across all 96 task categories), and then performing a Ward & Hook clustering on the correlation matrices (Wilkinson, 1988). This was done for both the Core Technical importance ratings and the Overall importance ratings. These analyses were carried out for all 21 MOS included in the Synthetic Validity Project, not just for the 18 that were in the Project A data base, since the appropriate data were available and the larger sample should provide more stable results. Tables 4.3 and 4.4 show the correlation matrices and Figures 4.2 and 4.3 show the Ward & Hook results as a tree diagram. The numbers on the far right of the diagram are the distance metrics (1-Pearson *r*) just before two entities are combined. We selected four clusters as the most meaningful solution for the Core Technical importance ratings, and named the clusters Electronics, Administration/Support, Combat, and Mechanical/Construction, based on the MOS included in each cluster. We selected three clusters as the most meaningful solution for the Overall importance ratings and named the clusters Electronics/Repair, Administration/ Support, and Combat. These clusters are summarized in Figure 4.4.

Reduction of number of predictors in the synthetic equation. As a practical matter, it is unlikely that the Army can use all 26 attribute measures to predict MOS performance. Therefore, it is of some interest to explore methods of reducing the number of predictors used in synthetic equations and to evaluate the effects of those methods on the validity of the equations.

One obvious method for reducing the number of predictors is to use only the ASVAB measures. Three Project A predictor score composites that matched the Synthetic Validity attributes consisted only or largely of ASVAB measures. These three composites closely parallel measures of the ASVAB Verbal, Numerical, and Technical factors. We constructed synthetic equations using only these three measures, with their associated attribute-by-component weights. This method was called the ASVAB reduction.

We used two other methods that employed stepwise regression to reduce the number of predictors. In the first method, the full synthetic equation is first constructed using all attribute-by-component and component-by-job weights, and then the predictor contributing the least to predicting the full synthetic equation is dropped. This process continues until the reduced equation correlates less than .95 with the full equation. We selected the criterion of .95 because this insures that the correlation of the reduced equation with some external variable (such as job performance) will be reasonably close to the full equation with the external variable. This method was called the .95 stepwise reduction.

Table 4.3

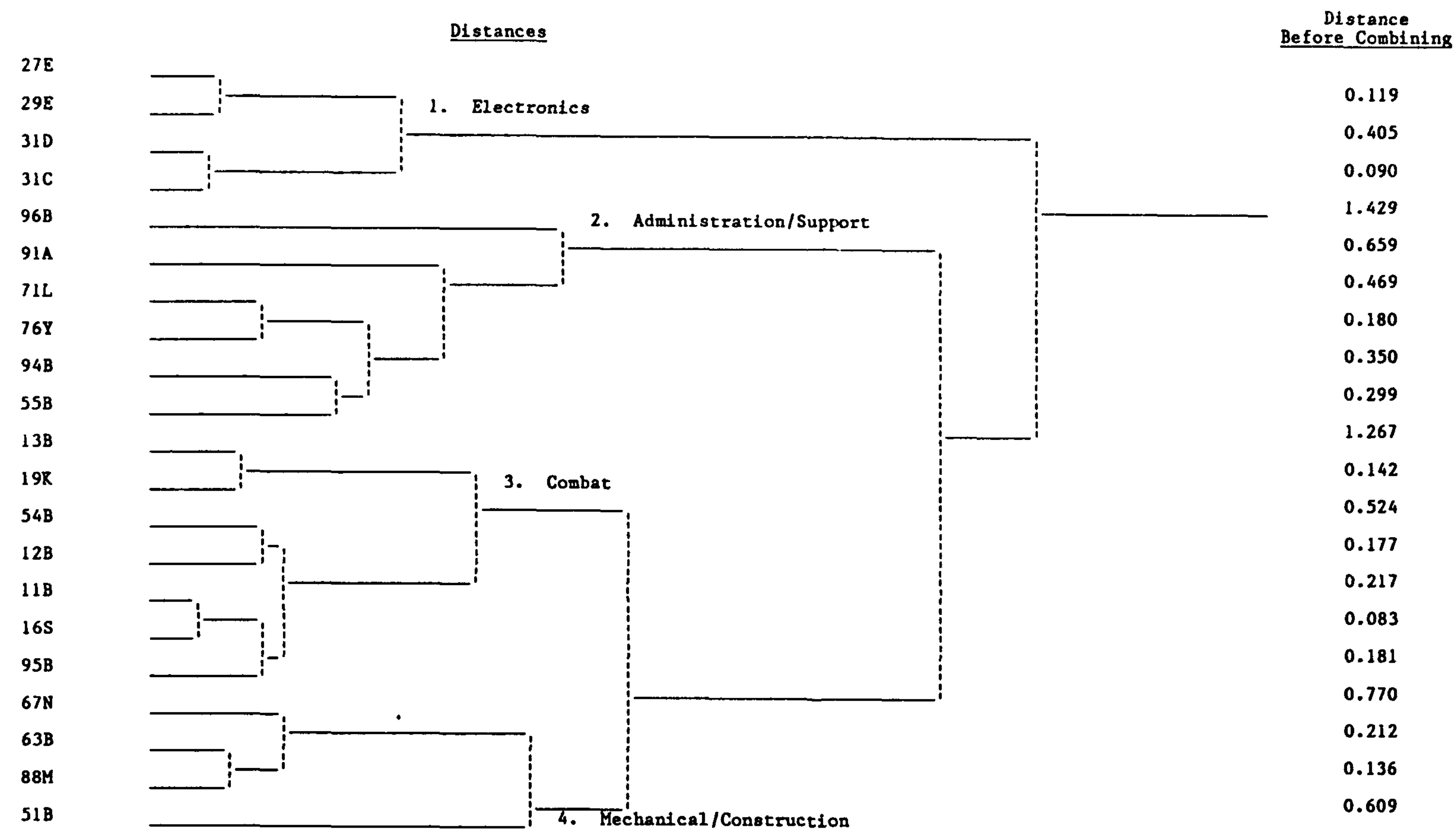
Pearson Correlation Matrix of 21 MOS, Based on Mean Core Technical Importance Profiles on 96 Tasks

	11B	12B	13B	16S	19K	27E	29E	31C	31D	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	1.00																			
12B	0.85	1.00																		
13B	0.80	0.65	1.00																	
16S	0.92	0.84	0.76	1.00																
19K	0.85	0.66	0.86	0.80	1.00															
27E	0.41	0.37	0.45	0.54	0.52	1.00														
29E	0.32	0.31	0.32	0.47	0.41	0.88	1.00													
31C	0.57	0.59	0.52	0.75	0.59	0.71	0.76	1.00												
31D	0.50	0.55	0.48	0.69	0.50	0.73	0.78	0.91	1.00											
51B	0.44	0.73	0.36	0.52	0.33	0.36	0.32	0.44	0.48	1.00										
54B	0.81	0.82	0.68	0.87	0.72	0.57	0.50	0.79	0.70	0.56	1.00									
55B	0.69	0.69	0.56	0.67	0.49	0.42	0.38	0.53	0.49	0.55	0.73	1.00								
63B	0.76	0.67	0.64	0.78	0.73	0.69	0.64	0.68	0.63	0.53	0.79	0.69	1.00							
67N	0.54	0.49	0.51	0.63	0.58	0.82	0.74	0.71	0.71	0.50	0.71	0.62	0.86	1.00						
71L	0.61	0.54	0.46	0.62	0.45	0.45	0.45	0.63	0.49	0.35	0.67	0.68	0.64	0.57	1.00					
76Y	0.48	0.43	0.45	0.53	0.40	0.54	0.43	0.57	0.46	0.37	0.63	0.73	0.60	0.65	0.82	1.00				
88M	0.79	0.73	0.71	0.84	0.71	0.55	0.47	0.67	0.62	0.58	0.83	0.79	0.86	0.76	0.68	0.68	1.00			
91A	0.52	0.46	0.40	0.55	0.39	0.40	0.36	0.50	0.46	0.30	0.61	0.55	0.56	0.53	0.68	0.59	0.64	1.00		
94B	0.49	0.46	0.44	0.54	0.38	0.50	0.44	0.54	0.50	0.47	0.63	0.70	0.63	0.66	0.67	0.75	0.71	0.60	1.00	
95B	0.84	0.77	0.62	0.85	0.61	0.41	0.38	0.67	0.59	0.42	0.80	0.66	0.67	0.54	0.78	0.57	0.76	0.64	0.53	1.00
96B	0.42	0.42	0.28	0.54	0.33	0.31	0.33	0.57	0.50	0.18	0.60	0.38	0.33	0.37	0.65	0.52	0.44	0.45	0.37	0.64

Table 4.4

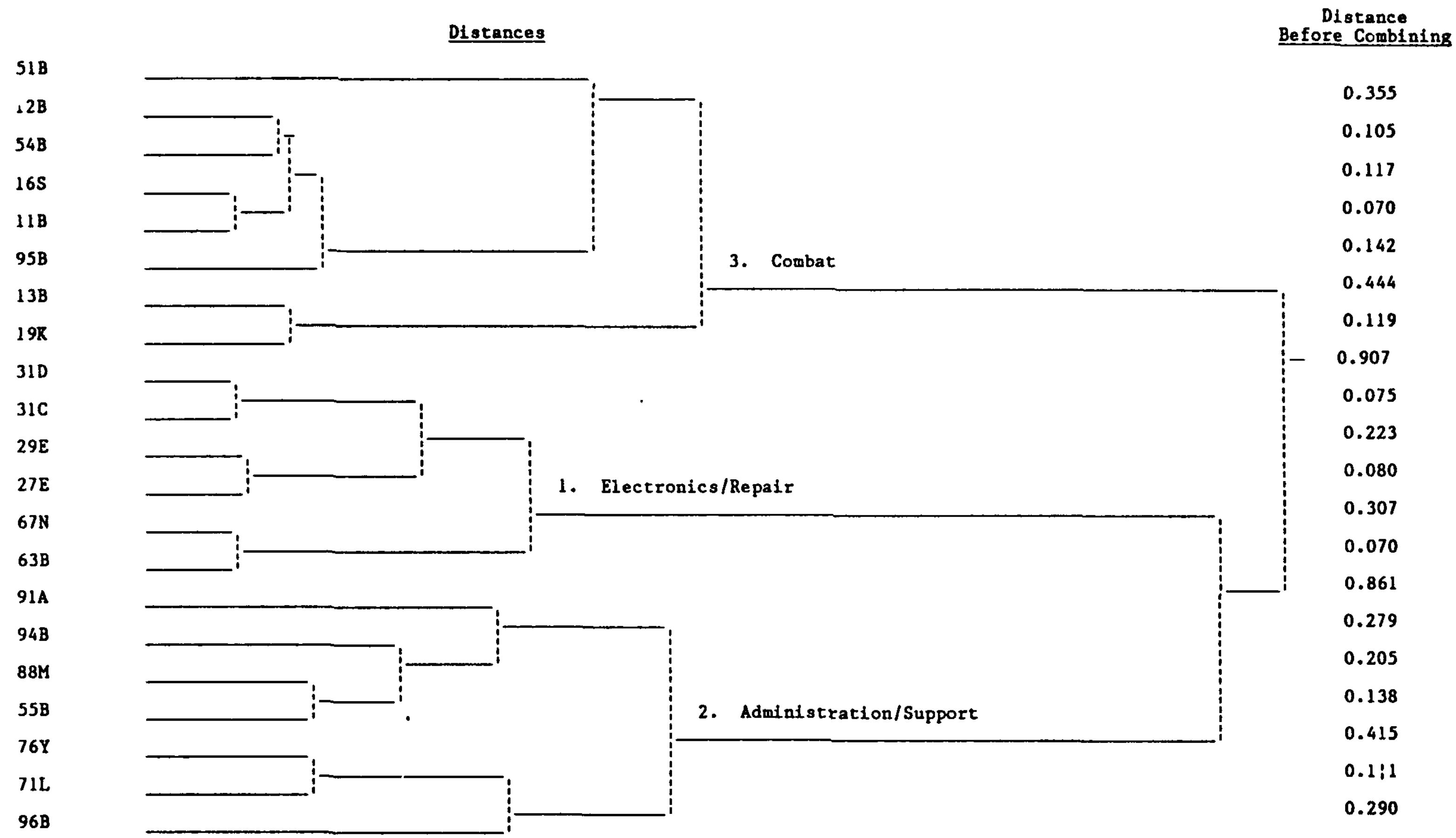
Pearson Correlation Matrix of 21 MOS, Based on Mean Overall Importance Profiles on 96 Tasks

	11B	12B	13B	16S	19K	27E	29E	31C	31D	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	1.00																			
12B	0.89	1.00																		
13B	0.86	0.76	1.00																	
16S	0.93	0.89	0.82	1.00																
19K	0.89	0.74	0.88	0.84	1.00															
27E	0.70	0.66	0.69	0.78	0.72	1.00														
29E	0.64	0.64	0.61	0.75	0.65	0.92	1.00													
31C	0.75	0.77	0.70	0.87	0.72	0.84	0.88	1.00												
31D	0.67	0.70	0.65	0.81	0.63	0.82	0.86	0.93	1.00											
51B	0.70	0.86	0.59	0.74	0.57	0.59	0.59	0.65	0.63	1.00										
54B	0.88	0.90	0.79	0.92	0.80	0.78	0.75	0.89	0.80	0.75	1.00									
55B	0.77	0.80	0.70	0.79	0.63	0.68	0.66	0.72	0.65	0.72	0.83	1.00								
63B	0.76	0.71	0.69	0.80	0.76	0.84	0.82	0.78	0.74	0.68	0.82	0.75	1.00							
67N	0.74	0.70	0.69	0.81	0.73	0.90	0.84	0.83	0.82	0.68	0.84	0.76	0.93	1.00						
71L	0.61	0.59	0.53	0.64	0.50	0.63	0.66	0.71	0.62	0.51	0.72	0.73	0.64	0.68	1.00					
76Y	0.64	0.61	0.61	0.67	0.57	0.70	0.65	0.71	0.63	0.56	0.76	0.82	0.71	0.77	0.87	1.00				
88M	0.85	0.81	0.79	0.88	0.78	0.76	0.73	0.79	0.74	0.75	0.88	0.86	0.88	0.87	0.71	0.79	1.00			
91A	0.72	0.68	0.63	0.75	0.61	0.66	0.65	0.73	0.67	0.57	0.79	0.72	0.72	0.74	0.74	0.73	0.81	1.00		
94B	0.67	0.65	0.61	0.70	0.57	0.67	0.66	0.71	0.65	0.64	0.76	0.80	0.75	0.77	0.75	0.82	0.82	0.74	1.00	
95B	0.87	0.85	0.73	0.90	0.71	0.70	0.69	0.82	0.74	0.67	0.89	0.78	0.71	0.74	0.77	0.70	0.83	0.79	0.69	1.00
96B	0.69	0.70	0.58	0.77	0.58	0.62	0.63	0.78	0.70	0.52	0.81	0.67	0.58	0.64	0.79	0.71	0.70	0.70	0.62	0.84



Note. Distance metric is 1-Pearson correlation coefficient. Ward minimum variance method used.

Figure 4.2. Cluster analysis of 21 MOS based on Mean Core Technical Importance Ratings on 96 tasks.



Note. Distance metric is 1-Pearson correlation coefficient. Ward minimum variance method used.

Figure 4.3. Cluster analysis of 21 MOS based on Mean Overall Importance Ratings on 96 tasks.

CORE TECHNICAL PROFICIENCY

Cluster	MOS
1. Electronics	27E, 29E, 31C, 31D
2. Administration/ Support	55B, 71L, 76Y, 91A, 94B, 96B
3. Combat	11B, 12B, 13B, 16S, 19K, 54B, 95B
4. Mechanical/ Construction	51B, 63B, 67N, 88M

OVERALL PERFORMANCE

Cluster	MOS
1. Electronics/ Repair	27E, 29E, 31C, 31D, 63B, 67N
2. Administration/ Support	55B, 71L, 76Y, 88M, 91A, 94B, 96B
3. Combat	11B, 12B, 13B, 16S, 19K, 51B,54B, 95B

Note: No attribute x job performance validity matrix is available for the underlined MOS (29E, 31D, 96B). These MOS were not included in the synthetic equation analyses.

Figure 4.4. MOS clusters based on Mean Task Importance for Core Technical Proficiency and Overall Performance.

The second stepwise reduction method used the same reduction technique except that the reduction continued until only five predictors remained in the equation. Five was chosen arbitrarily, but it seemed to be a reasonable number from a practical viewpoint. This method was called the top five stepwise reduction.

"Empirical Weights." In addition to the synthetically produced predictor composites, we developed "empirical" prediction equations using least-squares regression of the 26 predictor measures against the Core Technical and Overall Performance criterion composites within each of the 18 MOS.

We also developed equations for each MOS using the three ASVAB predictors against the Core Technical criterion and against the Overall Performance criterion. When the same empirical data were used to estimate the validity of the empirical composites that were used to develop them, (e.g., when the equation developed on the 19K sample was applied to the 19K sample), we applied adjustments to yield unbiased estimates of cross-validated coefficients for these composites. We used three different adjustments to correct the bias. Two of these were from Claudy (1978). One provided an estimate of the population multiple correlation coefficient (i.e., the coefficient that would result if one could obtain the actual population weights for the least squares equation, Equation 12, p. 603) and one provided an estimate of the validity coefficient in the population for the sample-derived weights (unnumbered equation, p. 606). These two methods of adjustment were arrived at through empirical means based on some Monte Carlo work. The third adjustment is from Rozeboom (1978, Equation 8, p. 1350), based on Browne's earlier work, and also provides an estimate of the population validity coefficient for the sample-derived weights. We had used Claudy's estimate of the population multiple correlation coefficient in the first two phases, but decided that an estimate of the validity coefficient in the population when using the sample-derived weights was the more appropriate estimate for the actual applied problem of predicting job performance for future Army applicants using weights derived from Project A samples. We wished to continue to provide the earlier used estimate as well as to try out two different estimates of the validity coefficient, one (Claudy's) that was empirically based and one (Rozeboom's) that was derived analytically and fairly widely accepted as an accurate estimate of the validity of sample-derived weights (see Mitchell and Klimoski, 1986).

On the other hand, no adjustments were made when we estimated the validity of the empirical equation developed for one job for predicting performance in a different job. This is because the criterion data for the other jobs were not used in the development of the empirical weights, therefore removing the possibility of positive bias due to error-fitting.

Analyses

Figure 4.5 shows a representation of the synthetic equations that were created from the variations in method described above. Each row in this figure represents a set of 18 equations (one equation for each of the MOS) and describes the criterion it was designed to predict, the type of component-by-job weights, the type of attribute-by-component weights, and the method used to reduce the number of predictors in the equation. The "Run ID#" corresponds to the table numbers in Appendices E and F. This order was chosen for clarity, and does not represent a necessary sequencing of the analyses. For example, run #1 was designed to predict Core Technical Proficiency (and thus the Core Technical importance ratings were used for component-by-job weights), "MOS Mean" component-by-job weights were used, mean validity ratings were used for attribute-by-component weights, and the reduction method was "none," i.e., no reduction was done. Table 4.5 shows the normalized weights for each of the 26 attribute measures for each of the 18 MOS for run #1. (See Appendix E, page v, for a key to the attribute abbreviations used as column headings.) By way of comparison, Table 4.6 shows the least squares Beta weights ("empirical weights") for the 26 attribute measures for predicting Core Technical Proficiency for each of the 18 MOS. (Tables showing weights for all methods are found in Appendix E.)

As shown in Figure 4.5, there were 40 "runs" or different types of synthetic equations computed for each of the 18 MOS. Table 4.7 shows the results of one such run, i.e., the correlations of the 18 synthetic composites depicted in Table 4.5 with Core Technical Proficiency for the 18 MOS. The correlations on the diagonal in this table represent the absolute validities of the composites (i.e., the correlations between each composite and Core Technical Proficiency in the particular MOS for which it was developed), whereas the correlations on the off-diagonal represent the validities of the composites for predicting Core Technical Proficiency in the other MOS. Note that the upper and lower triangles of this matrix are most easily interpreted row by row, for example, the "11B" row shows the validity coefficients obtained when the equation developed for 11B is applied to all the MOS, and the "12B" row shows the validity coefficients obtained when the equation developed for 12B is applied to all MOS. Table 4.8 shows similar results for the "empirical" or least squares composites for predicting Core Technical Proficiency.

Table 4.9 shows the results for the least squares equations developed for each of the 18 MOS when all 26 predictors are used to predict Core Technical Proficiency and Overall Performance. Shown are the foldback multiple correlation coefficient (r), the Claudy estimate of the population multiple correlation coefficient (Claudy Pop. R), the Claudy estimate of the validity of the sample weights in the population (Claudy Vldty), and the Rozeboom estimate of the validity of the sample weights in the population (Rozeboom Vldty). The table also shows the means

	Criterion		Component x Job Weights				Attribute x Component Weights			Reduction Method			
Run ID #	Core	Overall	MOS $\bar{X}$	MOS Thres	Clus $\bar{X}$	Cluster Thres	$\bar{X}$ Validities	0-1 Weights	0-$\bar{X}$ Weights	None	.95 Stepwise	Top 5 Stepwise	ASVAB
1	x		x				x			x			
2	x		x					x		x			
3	x		x						x	x			
4	x		x				x				x		
5	x		x				x					x	
6	x		x				x						x
7	x			x			x			x			
8	x			x				x		x			
9	x			x					x	x			
10	x			x			x						x
11	x				x		x			x			
12	x				x			x		x			
13	x				x				x	x			
14	x				x		x				x		
15	x				x		x					x	
16	x				x		x						x
17	x					x	x			x			
18	x					x		x		x			
19	x					x			x	x			
20	x					x	x						x
21		x	x				x			x			
22		x	x					x		x			
23		x	x						x	x			
24		x	x				x				x		
25		x	x				x					x	
26		x	x				x						x
27		x		x			x			x			
28		x		x				x		x			
29		x		x					x	x			
30		x		x			x						x
31		x			x		x			x			
32		x			x			x		x			
33		x			x				x	x			
34		x			x		x				x		
35		x			x		x					x	
36		x			x		x						x
37		x				x	x			x			
38		x				x		x		x			
39		x				x			x	x			
40		x				x	x						x

Figure 4.5. Elements entering the various synthetic validity equations.

Table 4.5

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Mean Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.13	.13	.09	.11	.10	.10	.11	.08	.08	.07	.07	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
12B	.13	.13	.09	.11	.10	.09	.10	.09	.08	.07	.07	.07	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
13B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.08	.07	.06	.06	.04	.06	.02	.07
16S	.13	.13	.09	.11	.10	.10	.11	.08	.07	.07	.06	.07	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.04	.06	.02	.07
19K	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.07	.08	.05	.10	.07	.08	.09	.07	.08	.07	.06	.07	.04	.05	.02	.07
27E	.14	.13	.10	.10	.10	.09	.11	.10	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.08	.05	.05	.08	.05	.06	.02	.07
31C	.14	.13	.10	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.05	.05	.07	.05	.06	.02	.07
51B	.13	.12	.09	.11	.09	.09	.10	.09	.08	.08	.06	.08	.06	.11	.07	.08	.09	.07	.08	.07	.05	.07	.04	.06	.02	.07
54B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
55B	.14	.13	.09	.10	.10	.10	.11	.08	.08	.07	.06	.07	.06	.11	.08	.09	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
63B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.06	.08	.05	.10	.07	.08	.09	.07	.08	.06	.06	.07	.04	.06	.02	.07
67N	.14	.13	.10	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.11	.07	.08	.09	.07	.07	.05	.05	.07	.05	.06	.02	.08
71L	.15	.13	.10	.09	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.09	.08	.06	.05	.06	.06	.04	.06	.03	.08
76Y	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.08	.05	.11	.07	.08	.10	.07	.07	.05	.05	.06	.04	.06	.02	.08
88M	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.05	.11	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
91A	.15	.13	.10	.10	.10	.09	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.08	.06	.05	.06	.06	.05	.06	.03	.08
94B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.10	.07	.06	.05	.05	.06	.04	.06	.03	.08
95B	.14	.13	.09	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.09	.08	.06	.06	.06	.06	.04	.07	.02	.07

Table 4.6

Least Squares Beta Weights for 18 MOS: Core Technical Proficiency, No Reduction

	Attribute																							
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.23	.11	.08	.09	-.01	.13	.07	.14	.01	.02	-.01	.03	.02	.05	-.11	-.03	.11	.04	.02	.12	-.05	.06	-.06	.02	-.05	-.03
12B	.17	.14	.03	.03	.03	-.04	.03	.40	-.02	.00	.02	-.02	-.01	.12	.02	.09	-.04	-.18	-.03	.05	-.06	.01	.02	-.04	.03	-.00
13B	.10	.09	.10	.13	.03	.03	.03	-.06	-.07	.04	.05	.04	-.02	-.01	.06	-.06	.06	.04	.13	.18	-.06	.03	-.03	-.02	-.02	-.10
16S	.22	.22	.24	.05	-.03	-.04	.01	-.17	.01	.05	-.01	.06	-.04	.02	-.03	.07	.10	-.10	-.06	.12	.02	.06	.02	-.02	-.12	-.03
19K	.07	.11	.12	.12	.05	.06	-.01	.24	.05	-.06	-.04	.08	-.07	.03	.03	-.08	.09	-.04	-.01	.14	.04	-.01	-.03	.05	.04	-.02
27E	.39	-.18	.34	.06	-.05	-.00	.01	-.00	.03	.12	-.06	.11	-.07	.19	.05	-.18	.00	-.00	.14	.20	-.18	-.31	-.02	.12	.11	-.10
31C	.25	.05	.39	-.04	-.02	-.02	.01	.17	.00	.06	-.09	-.01	-.00	.09	-.09	.01	.10	-.11	.12	-.09	.02	.11	.05	-.06	-.05	.03
51B	.26	.24	.19	.23	-.03	-.15	.14	.17	-.02	-.07	-.04	.19	.07	-.40	.19	-.16	.17	.27	.11	.21	-.14	-.15	-.31	.28	.28	-.12
54B	.32	.26	.16	-.06	.00	-.06	.05	.09	-.05	.13	-.13	.10	-.10	.21	.06	-.07	-.02	-.00	.03	.02	-.04	-.03	.04	-.12	-.05	.03
55B	.40	.15	-.08	-.07	.03	-.00	-.04	.21	-.10	.25	-.06	-.06	-.07	-.10	-.00	.20	.02	-.02	.12	.01	-.05	.01	.08	-.03	-.14	-.02
63B	.02	.14	-.02	-.01	.06	.05	.01	.42	-.02	.00	.02	.05	-.05	.07	.05	-.10	.11	-.02	.27	.06	-.08	-.11	.02	-.00	-.05	-.01
67N	.22	.04	-.04	.23	-.06	-.07	.02	.48	-.02	.02	.08	-.01	.01	-.10	-.07	.11	.11	.03	-.03	-.02	.03	-.05	.14	-.11	.02	-.04
71L	.14	.30	.24	.07	.01	-.03	.06	-.11	-.06	.02	-.00	.02	-.05	.08	.05	-.04	.09	-.09	-.12	-.02	.02	.01	.07	.03	-.03	.02
76Y	.07	.08	.38	-.01	.06	.06	-.06	.18	-.00	-.07	-.08	-.01	-.04	.14	-.01	.01	.03	-.09	.02	-.04	-.07	-.04	.04	.09	-.03	.02
88M	-.04	.25	.10	-.08	.02	.09	.05	.39	.01	-.05	-.02	-.01	-.05	-.05	.03	.03	.10	-.03	.05	.06	.01	-.02	-.02	.04	-.01	-.05
91A	.34	.17	.09	.03	.05	.08	-.07	.08	-.03	.01	.00	.03	-.09	.03	.02	-.11	.18	.05	.08	.13	.04	-.11	.04	-.05	.06	-.05
94B	.04	.23	.32	.02	.10	-.08	.15	.23	-.11	-.01	.04	-.05	-.05	.03	-.05	.09	.00	-.01	-.09	-.07	.03	-.11	.05	.03	.08	.04
95B	.21	.21	.17	.00	-.01	.01	.00	.12	-.05	.06	.00	.08	.01	-.04	.04	.04	.09	.00	-.02	-.03	.06	-.05	-.12	.09	-.01	-.02

Table 4.7

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.45	.36	.44	.57	.47	.49	.79	.61	.49	.50	.74	.53	.44	.48	.60	.57	.50
12B	.68	.49	.38	.47	.61	.51	.52	.85	.65	.52	.53	.79	.56	.47	.52	.64	.61	.53
13B	.69	.50	.39	.48	.62	.52	.54	.87	.67	.54	.55	.81	.58	.48	.53	.66	.63	.54
16S	.65	.46	.36	.45	.58	.49	.51	.81	.63	.50	.51	.76	.55	.45	.50	.62	.59	.51
19K	.62	.45	.35	.43	.56	.47	.49	.77	.60	.48	.49	.72	.52	.43	.48	.59	.56	.48
27E	.70	.51	.40	.49	.63	.54	.56	.89	.69	.54	.56	.83	.60	.50	.54	.67	.65	.55
31C	.67	.48	.38	.46	.60	.51	.53	.84	.65	.51	.52	.78	.57	.48	.51	.64	.62	.53
51B	.59	.42	.33	.41	.53	.44	.46	.74	.57	.45	.47	.69	.49	.41	.45	.56	.53	.46
54B	.62	.44	.35	.43	.56	.47	.49	.78	.60	.48	.48	.73	.53	.44	.47	.59	.57	.49
55B	.69	.49	.38	.48	.62	.52	.54	.86	.67	.53	.54	.81	.58	.48	.52	.65	.63	.54
63B	.67	.48	.38	.46	.60	.51	.52	.84	.65	.52	.53	.78	.56	.47	.52	.63	.61	.52
67N	.56	.41	.32	.39	.51	.43	.45	.71	.55	.43	.44	.66	.48	.40	.43	.54	.52	.45
71L	.58	.41	.32	.40	.52	.44	.46	.73	.57	.44	.45	.68	.50	.42	.44	.56	.54	.47
76Y	.68	.49	.38	.47	.61	.52	.54	.86	.66	.52	.53	.80	.58	.49	.52	.65	.63	.54
88M	.66	.47	.37	.45	.59	.49	.51	.82	.63	.50	.52	.77	.55	.46	.50	.62	.60	.52
91A	.65	.46	.36	.45	.58	.49	.51	.82	.63	.49	.50	.76	.56	.47	.49	.62	.60	.52
94B	.63	.45	.35	.44	.57	.48	.50	.80	.62	.48	.49	.74	.54	.45	.48	.60	.58	.50
95B	.65	.46	.36	.45	.58	.49	.51	.82	.63	.49	.50	.76	.56	.46	.49	.62	.60	.52

Table 4.8

Validities of Least Squares Prediction Equations for 18 MOS: Core Technical Proficiency, No Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.75	.64	.43	.50	.67	.70	.57	.88	.71	.67	.62	.77	.54	.56	.60	.74	.65	.59
12B	.64	.70	.42	.44	.61	.72	.60	.82	.74	.76	.69	.78	.52	.59	.60	.67	.65	.57
13B	.69	.62	.49	.50	.67	.65	.50	.97	.70	.70	.69	.78	.47	.43	.60	.71	.59	.56
16S	.66	.57	.40	.59	.60	.66	.58	.88	.70	.60	.49	.64	.64	.56	.52	.63	.66	.58
19K	.69	.63	.43	.50	.68	.70	.59	.83	.72	.58	.63	.83	.57	.56	.61	.76	.65	.60
27E	.57	.59	.38	.45	.57	.86	.50	.82	.68	.67	.57	.72	.47	.54	.47	.79	.57	.58
31C	.62	.59	.36	.46	.56	.74	.69	.86	.72	.66	.59	.74	.59	.64	.56	.67	.66	.54
51B	.75	.67	.46	.56	.72	.82	.56	.93	.75	.56	.61	.91	.58	.59	.58	.92	.68	.75
54B	.63	.61	.39	.50	.59	.70	.58	.88	.78	.74	.60	.76	.62	.62	.56	.69	.66	.59
55B	.58	.61	.35	.41	.55	.58	.51	.85	.66	.76	.67	.73	.40	.48	.53	.55	.51	.51
63B	.50	.55	.40	.31	.54	.61	.48	.80	.62	.62	.75	.76	.33	.38	.58	.60	.47	.46
67N	.66	.65	.39	.45	.60	.67	.59	.84	.69	.72	.61	.84	.46	.54	.56	.69	.60	.59
71L	.58	.45	.33	.50	.51	.54	.54	.76	.63	.47	.35	.59	.68	.59	.43	.60	.70	.58
76Y	.59	.57	.34	.42	.56	.69	.60	.80	.68	.56	.54	.70	.60	.69	.50	.67	.70	.60
88M	.68	.64	.42	.45	.65	.65	.58	.84	.72	.62	.71	.80	.52	.55	.64	.68	.63	.61
91A	.64	.59	.40	.48	.63	.67	.57	.89	.72	.64	.60	.84	.55	.54	.56	.78	.64	.62
94B	.61	.53	.36	.46	.57	.63	.61	.71	.68	.60	.48	.70	.65	.65	.50	.68	.77	.66
95B	.70	.60	.39	.53	.61	.66	.59	.82	.72	.57	.56	.75	.62	.61	.54	.73	.68	.63

across all 18 MOS for the various coefficients. Note that the foldback coefficient (e.g., when the equation developed on the 13K Sample was applied to 19K) is always highest, of course, followed in order by the Claudy population R, the Claudy validity estimate, and the Rozeboom validity estimate. The two validity estimates are about .03 lower than the Claudy population R estimate, as expected. More importantly, however, note that the two validity estimates are very close in magnitude--the mean estimates differ by .006 for Core Technical Proficiency and by .007 for Overall Performance. Table 4.10 shows the same set of results when only the three ASVAB predictors enter the equation. In this case, there is much less shrinkage because so few predictors are used compared to the full set of predictors (3 versus 26). Note that the same pattern of results still holds, however, and we again see a small difference between the two validity estimates.

Table 4.11 shows the absolute and discriminant validities for each of the 40 synthetic validation equations. Each of the 40 absolute validities shown in this table is the mean validity computed across the 18 MOS. In order to provide an estimate of the statistical significance of the differences between these absolute validities, we computed the two-way analysis of variance with MOS (18 levels) and Method (40 levels) as main effects, and the MOS x Method interaction as the error term. The mean squares (rounded to thousandths) from the ANOVA were .021 for Method ($F[39,663] = 12.29$, $p<.001$), .269 for MOS ($F[17,663] = 156.38$, $p<.001$), and .002 for the interaction effect, which is the mean squared error. The value of the interaction effect is the standard error for comparing the absolute validities. Thus, the 95% confidence interval is plus or minus .004 around each coefficient. Basically, this means that a difference of .01 between absolute validity coefficients is statistically significant. This level of difference is probably not practically significant, but it should be kept in mind that even very small differences in validity can be meaningful for organizations with a huge volume of annual selection decisions (i.e., the U. S. Army).

Also shown in Table 4.11, for comparison, are the absolute and discriminant validities for the least squares equations, using the Rozeboom validity estimates to compute the absolute validities. The complete set of validity matrices appears in Appendix F.

<u>General summary of results</u>. In summary, the synthetic equations produced high levels of absolute validity and very low levels of discriminant validity. The lowest absolute validity for a synthetic equation in Table 4.11 is .55, whereas the highest discriminant validity is .02. The values for the least squares equations in Table 4.11 show the maximum values that we might expect for these data, and these show discriminant validities for the full set of predictors of .06 for Core

Table 4.9

Validity Estimates for 18 MOS Using All 26 Predictors to Predict Core Technical Proficiency and Overall Performance

Core Technical Proficiency					Overall Performance				
MOS	r[1]	Claudy Pop. R[2]	Claudy Vldty[3]	Rozeboom Vldty[4]	MOS	r[1]	Claudy Pop. R[2]	Claudy Vldty[3]	Rozeboom Vldty[4]
11B	.747	.732	.716	.713	11B	.699	.680	.661	.657
12B	.702	.685	.668	.665	12B	.679	.660	.641	.638
13B	.492	.447	.401	.390	13B	.498	.454	.409	.398
16S	.585	.539	.493	.482	16S	.651	.616	.580	.573
19K	.677	.650	.623	.618	19K	.708	.685	.661	.656
27E	.861	.823	.785	.776	27E	.851	.810	.769	.759
31C	.685	.648	.612	.604	31C	.633	.587	.542	.531
51B	.932	.892	.852	.842	51B	.914	.862	.810	.798
54B	.776	.756	.736	.732	54B	.728	.703	.678	.672
55B	.756	.716	.677	.668	55B	.616	.542	.467	.444
63B	.747	.731	.715	.712	63B	.623	.596	.569	.564
67N	.843	.824	.804	.800	67N	.838	.818	.798	.793
71L	.681	.657	.633	.628	71L	.650	.623	.595	.590
76Y	.686	.663	.641	.636	76Y	.613	.583	.552	.546
88M	.640	.616	.593	.588	88M	.601	.573	.546	.541
91A	.784	.768	.752	.748	91A	.680	.653	.627	.621
94B	.771	.752	.734	.730	94B	.635	.601	.566	.559
95B	.676	.659	.642	.638	95B	.733	.720	.706	.704
Mean	.725	.697	.671	.665	Mean	.686	.654	.621	.614

[1]Foldback Multiple Correlation Coefficient. [2]Claudy Estimate of Population Multiple Coefficient. [3]Claudy Estimate of Population Validity of Sample Weights. [4]Rozeboom Estimate of Population Validity of Sample Weights.

Table 4.10

Validity Estimates for 18 MOS Using 3 ASVAB Predictors to Predict Core Technical Proficiency and Overall Performance

Core Technical Proficiency					Overall Performance				
MOS	r[1]	Claudy Pop. R[2]	Claudy Vldty[3]	Rozeboom Vldty[4]	MOS	r[1]	Claudy Pop. R[2]	Claudy Vldty[3]	Rozeboom Vldty[4]
11B	.680	.679	.678	.675	11B	.580	.578	.577	.573
12B	.671	.670	.669	.666	12B	.581	.580	.578	.575
13B	.388	.384	.380	.373	13B	.355	.350	.346	.339
16S	.508	.505	.502	.495	16S	.514	.511	.508	.501
19K	.627	.625	.624	.620	19K	.602	.600	.599	.594
27E	.787	.785	.784	.775	27E	.760	.758	.756	.746
31C	.635	.633	.631	.625	31C	.550	.547	.544	.537
51B	.837	.835	.834	.821	51B	.741	.737	.733	.713
54B	.727	.726	.725	.721	54B	.652	.650	.649	.644
55B	.713	.711	.710	.703	55B	.497	.491	.486	.474
63B	.680	.679	.678	.675	63B	.489	.487	.484	.479
67N	.811	.810	.810	.806	67N	.797	.796	.796	.791
71L	.599	.597	.596	.591	71L	.556	.554	.552	.547
76Y	.646	.645	.644	.640	76Y	.543	.541	.539	.534
88M	.595	.594	.592	.589	88M	.516	.514	.512	.507
91A	.726	.725	.724	.721	91A	.573	.571	.569	.564
94B	.695	.694	.693	.689	94B	.514	.511	.508	.502
95B	.627	.626	.625	.622	95B	.656	.655	.654	.652
Mean	.664	.662	.661	.656	Mean	.582	.580	.577	.671

[1]Foldback Multiple Correlation Coefficient. [2]Claudy Estimate of Population Multiple Correlation Coefficient. [3]Claudy Estimate of Population Validity of Sample Weights. [4]Rozeboom Estimate of Population Validity of Sample Weights.

Table 4.11
Absolute and Discriminant Validities by Synthetic Validity Method

Job Component Weights (96 Task Categories)	Attribute-by-Component Weights: Mean Validities	Attribute-by-Component Weights: 0-1 Weights	Attribute-by-Component Weights: 0-Mean Weights	Methods of Reducing Predictor Sets: .95 Stepwise Reduction	Methods of Reducing Predictor Sets: Top 5 Stepwise Reduction	Methods of Reducing Predictor Sets: ASVAB[1] Reduction
Core Technical Proficiency						
MOS						
Mean Importance	.55[2]/.00[3]	.63/.01	.64/.01	.55/.00	.56/.00	.64/.00
Threshold Importance	.56/.01	.62/.02	.62/.02	------	------	.65/.00
Cluster						
Mean Importance	.55/.00	.63/.00	.64/.00	.56/.01	.57/.01	.64/.00
Threshold Importance	.57/.01	.63/.01	.64/.01	------	------	.64/.00
Least Squares[4] (Corrected)		.67/.06				.66/.03
Overall Performance						
MOS						
Mean Importance	.56/.00	.59/.00	.59/.00	.56/.00	.56/.00	.57/.00
Threshold Importance	.56/.00	.57/.01	.57/.01	------	------	.57/.00
Cluster						
Mean Importance	.56/-.01	.59/.00	.59/.00	.56/.00	.56/.00	.57/.00
Threshold Importance	.56/.00	.56/.00	.56/.00	------	------	.57/.00
Least Squares[4] (Corrected)		.61/.01				.57/.01

[1]Project A Measures: A1AVERBL, A1AQUANT + B3CCNMSH, and A1ATECH. [2]Absolute Validity = mean validity coefficient computed across 18 MOS. [3]Discriminant Validity = mean absolute validity minus mean validity obtained by applying MOS equations developed for different MOS to a target MOS, computed across all 18 MOS. [4]Absolute and discriminant validities for the least squares equations, using all 26 predictors (first set of figures) or using the 3 ASVAB predictors (second set of figures). The absolute validity was computed on adjusted coefficients, using Rozeboom's equation #8.

Technical and .01 for Overall, and discriminant validities for the ASVAB only of .03 for Core Technical and .01 for Overall Performance. Thus, in the best case (0-1 or 0-mean attribute weights with MOS threshold component weights for Core Technical), it appears that the synthetic equations obtain 93% of the absolute validity and 33% of the discriminant validity of the least squares equations.

<u>The criterion predicted</u>. In general, the Core Technical Proficiency criterion appears to be better predicted than the Overall Performance criterion, although both are well predicted by the synthetic methods. This is especially so for synthetic equations using 0-1 or 0-mean validity weights for the attribute-by-component weights (*r* of .62 or .64 vs. .56 to .59). Synthetic equations containing only ASVAB predictors also do not predict the Overall Performance criterion as well as the Core Technical Proficiency criterion (*r* of .64 or .65 vs. .57). Given the generally low level of discriminant validity obtained, it is not surprising that there is little difference between the discriminant validities for the two criteria.

<u>Attribute-by-component weights</u>. The 0-1 weights and 0-mean weights produced nearly identical results and showed higher absolute validities than did the mean validity weights, especially for Core Technical Proficiency (*r* of .62 to .64 vs. *r* of .55 to .57). The 0-1 and 0-mean weights produced slightly higher levels of discriminant validity, but these were still very low (no more than .02).

<u>Component-by-job weights</u>. Variations in methods of forming these weights appeared to have little impact on either absolute validity or discriminant validity, although there does appear to be a small reduction in absolute validity for predicting Overall Performance when using threshold weights.

<u>Method of reducing the number of predictors in the synthetic equation</u>. The two stepwise reduction methods produced almost identical results, about .56 absolute validity and .00 or .01 discriminant validity. This is not too surprising when one considers that the .95 stepwise reduction method produced equations having seven or eight predictors and that the top five stepwise reduction method produced equations that correlated about .92 or .93, on average, with the full synthetic equation (mean validities and MOS mean component weights, no reduction method applied). Also, inspection of the attribute weights produced by the two methods (see Appendix E Tables 4, 5, 14, 15, 24, 25, 34, and 35) shows considerable overlap in the attributes that are weighted. Generally speaking, the attributes most frequently weighted across reduction method and MOS were: Verbal Ability, Reasoning, Spatial Ability, Memory, Eye-Limb Coordination, Work Orientation, Interest in Using Tools, Interest in Technical Activities, and Interests in Leadership. Thus, the two methods produced equations that stepped down from 26 predictors to 5-8 predictors and correlated about .92 to .95 with

the full equation. The remarkable observation about these results is the consistency of obtained validity for the reduced equations compared to the full equations (the first column contains the full equation validity corresponding to the reduced equation). The difference in the validities is never more than .02. This demonstrates that the stepwise method is preserving the level of validity in the original, non-reduced equation.

Use of only ASVAB predictors produces validities for Core Technical Proficiency that are equal to (or .01 higher than) the validities for the best non-reduced synthetic equations. This is not too surprising since Project A results have already shown that the new predictors developed for Project A provide no incremental validity for predicting this criterion. No discriminant validity was found for the ASVAB-only synthetic equations, also not surprising given that there was very little discriminant validity (0.03) for the least squares equations.

With regard to predicting Overall Performance, the ASVAB-only equations do equally well or .02 lower when compared to the non-reduced, synthetic equations. The Overall Performance criterion is a weighted sum of all five Project A criterion constructs, so we might have expected a bit more improvement when all the predictors were included. No discriminant validity was obtained here either, but there was even less available since the discriminant validity for the least squares equations was just .01.

Comparison of Synthetic Validation Model to Validity Generalization Model

The synthetic validation model is one method of developing a prediction equation for jobs for which no empirical validity data are available, for whatever reason. Other models exist for this purpose, notably the validity generalization or validity transportability model (Schmidt & Hunter, 1981). Very briefly described, in this model "new" jobs or jobs for which appropriate empirical data do not exist are compared to "existing" jobs for which such data do exist. If a match is made between a new job and an existing job, then the validity evidence for the existing job is deemed to be relevant for the new job. This allows the selection methods for the existing job to be used for the new job. Of course, new jobs need not be matched to specific existing jobs. They could be matched to clusters of existing jobs, or, in the extreme, research could be carried out to demonstrate that one equation could serve to predict performance for all jobs in an organization (or however the population of relevant jobs is defined). In order for the synthetic validation model to receive serious consideration, it must provide validity results at least comparable to those provided by the validity transportability model.

There is not universal agreement on the appropriate data or index to determine the degree to which a new job matches an existing job. However, the completion of a structured task questionnaire, such as the Army Task Questionnaire, by appropriate samples of experts on the target jobs appears to us to provide appropriate data for matching jobs. Computation of correlations between the mean task profiles for target jobs should also provide an appropriate index of the extent to which jobs are similar in terms of the task categories that must be performed on the job.

Method of Comparison

We carried out a comparison of the transportability and synthetic models as described below.

For these analyses, we considered 9 of the 18 MOS in the Project A data base to be the "existing" jobs and 9 of them to be the "new" jobs. The "existing" jobs were the Batch A MOS for which we had the more comprehensive data sets and, generally speaking, larger samples. The "new" jobs were the nine Batch Z jobs. We consider this to be an extremely powerful simulation of the actual applied situation that the Army must face.

First, we computed correlations between the Army Task Questionnaire profiles (on mean ratings of importance for Core Technical Proficiency) for the Batch A and Batch Z MOS in order to identify the Batch A MOS (the "existing" job) that was most similar to each Batch Z MOS (the "new" job). We defined "most similar to" as "most highly correlated with" for these investigations. We also identified the Core Technical cluster to which each Batch A and Batch Z MOS belonged (see Figure 4.2).

Second, we applied the empirical least squares equation for the "existing" job that most closely matched each "new" job to the "new" jobs and correlated the resulting composite scores with Core Technical Proficiency. This provided an estimate of the absolute transported or generalized validity for each new job. We also computed the off-diagonal validity coefficients, i.e., the correlations of the least squares equations for those "existing" jobs which were not most similar to the new jobs. The difference between the mean absolute validity and the mean off-diagonal validity provided an estimate of the discriminant validity for the method.

Third, we developed a least squares empirical equation for each of the four Core Technical clusters by using the pooled predictor-Core Technical criterion correlations (pooled across all Batch A MOS in a cluster) together with the predictor correlations computed across the entire Project A Concurrent Validation sample. These matrices had already been corrected for range restriction due to selection into the Army and the MOS, so it was appropriate to carry out the pooling. Table 4.12 shows the weights developed for the four clusters, as well as the

Table 4.12

Normalized Regression Weights for the Least Squares Equations Computed for the Four Batch A MOS Clusters and the General Batch A Group (All Nine Batch A MOS)

Predictor	Cluster M	Cluster A	Cluster C	Cluster E	Cluster G
Verb	-.016	.247	.169	.251	.151
Reas	.196	.232	.140	.049	.172
Numb	.050	.175	.119	.385	.131
Spat	-.043	.041	.078	-.040	.039
InPr	.032	.040	.014	-.024	.021
PS&A	.070	.017	.048	-.016	.045
Mem	.025	-.006	.022	.008	.015
Mech	.399	-.022	.093	.172	.139
E LC	-.001	-.036	-.021	.003	-.019
Prec	-.017	.016	.019	.056	.011
MJud	-.006	.016	-.003	-.094	-.014
Dext	.020	.029	.048	-.010	.042
Athl	-.054	-.066	-.021	-.003	-.043
WkOr	.013	.090	-.005	.091	.034
Coop	.030	.017	-.007	-.094	-.007
Ener	-.022	-.078	-.004	.008	-.017
Cons	.104	.111	.085	.095	.091
Dom	-.030	-.038	.045	-.109	-.004
Tool	.157	-.025	.026	.118	.063
Rugd	.062	.064	.090	-.093	.072
Prot	-.033	.020	.004	.016	-.003
Tech	-.073	-.051	-.000	.108	-.036
Sci	.000	.035	-.059	.052	-.038
Lead	.031	.007	.038	-.065	.039
Art	-.026	.034	-.015	-.047	.005
Org	-.037	-.026	-.048	.032	-.048

Intercorrelations of Least Squares Composites Created for the Four Batch A MOS Clusters and the General Batch A Group

	M	A	C	E	G
M	1.000	.806	.906	.794	.932
A	.806	1.000	.946	.874	.953
C	.906	.946	1.000	.856	.993
E	.794	.874	.856	1.000	.878
G	.932	.953	.993	.878	1.000

Note. M = Mechanical/Construction Cluster; A = Administration/Support Cluster; C = Combat Cluster; E = Electronics Cluster; G = General Cluster formed from all Batch A MOS

intercorrelations of the predicted scores computed from the equations. The appropriate cluster equation for each Batch Z MOS (i.e., the equation for the cluster to which the MOS belonged) was then used to compute a composite score which was correlated with Core Technical Proficiency to provide an estimate of the absolute validity for this method for each Batch Z MOS. The estimate of discriminant validity was obtained by subtracting the mean off-diagonal coefficient from the mean absolute validity coefficient, as described above.

Fourth, we developed a least squares empirical equation for all nine Batch A MOS by pooling across all nine jobs. The weights for this equation are also shown in Table 4.12. This equation was applied to all nine Batch Z MOS to provide an estimate of the absolute validity for a "General" model of validity transportability. Of course, there is no discriminant validity possible for this method since only one equation is used.

Fifth, we compared the validity coefficients (and the absolute and discriminant validities derived from them) obtained for the Batch Z MOS when these validity transportability models are used with those obtained when each of the Batch Z MOS "own" empirical least squares equation is used, and with those obtained when the various forms of the synthetic method are used.

In summary, we had matched each of nine "new" jobs to a single "existing" job and to a single cluster of "existing" jobs. These matches provided two least squares equations to apply to each new job. In addition, we had a "general" least squares equation that we could apply to each new job. These three "existing" jobs equations provide three different forms of the transportability model. The synthetic model was represented by the various forms of synthetic equations described earlier. Finally, since these nine "new" jobs were, in actuality, included in empirical validation research as part of Project A, we had available an estimate of validity for the case when an empirical study could be carried out for a "new" job (i.e., its "own" equation).

Results

Table 4.13 shows the correlations between Army Task Questionnaire profiles for the Batch A and Batch Z MOS. The highest correlation in each column represents the closest match to an existing job (Batch A MOS) for a new job (Batch Z MOS). All of the Batch Z MOS appear to have an acceptably high correlation with a Batch A MOS (> .70), indicating a close match, except for 51B (.58 correlation). Also, most of the matches do not have close rivals. With the exception of 27E, there are no other column correlations that are only .02 lower; usually they are at least .06 or .07 lower. Note that 12B and 16S both match most closely with 11B, and that 51B, 55B, and 94B all match most closely with 88M.

Table 4.14 shows the validity coefficients produced when the empirical least squares equations for the Batch A MOS are applied to the Batch Z MOS. These are cross-validity coefficients and require no shrinkage adjustment. The highest column entries, or Batch Z validities, are underlined and the "most similar" validity coefficient is asterisked. In only one case does the highest validity for a Batch Z MOS occur for the "most similar" Batch A equation, for 27E. Thus, using the "closest job match" method as we have operationalized it would not produce the highest validities possible from the set of existing jobs. In general, however, the method does produce acceptably high validities; the mean of the asterisked validity coefficients is .67 with a standard deviation of .10.

While not directly relevant to the primary research question addressed in this section, the means and standard deviations of the row and column coefficients do provide some interesting information. The row coefficients provide an estimate of the

Table 4.13.

Correlations Between Army Task Questionnaire Profiles (Mean Importance Ratings for Core Technical Proficiency) for Project A Batch A and Batch Z MOS Included in the Synthetic Validity Project: Highest Column Correlations Underlined

	Batch Z MOS								
Batch A MOS	12B	16S	27E	51B	54B	55B	67N	76Y	94B
11B	.85	.92	.41	.44	.81	.66	.54	.48	.49
13B	.65	.76	.45	.52	.87	.67	.63	.53	.54
19K	.66	.80	.52	.33	.72	.49	.58	.40	.38
31C	.59	.75	.71	.44	.79	.53	.71	.57	.54
63B	.67	.78	.69	.53	.79	.69	.85	.60	.63
71L	.54	.62	.45	.35	.67	.68	.57	.82	.67
88M	.73	.84	.55	.58	.83	.79	.76	.68	.71
91A	.45	.55	.40	.30	.61	.55	.53	.59	.60
95B	.77	.85	.41	.42	.80	.66	.66	.57	.53

Table 4.14

Validity Coefficients of Least Squares Equations for Predicting Core Technical Proficiency, When Developed on Project A Batch A MOS and Applied to Project A Batch Z MOS: Highest Column Entries Underlined

Equation from Batch A MOS	Applied to Batch Z MOS										
	12B	16S	27E	51B	54B	55B	67N	76Y	94B	Mean	S.D.
11B	.64*	.50*	.70	.88	.71	.67	.77	.56	.65	.68	.10
13B	.62	.50	.65	<u>.97</u>	.70*	<u>.70</u>	.78	.43	.59	.66	.15
19K	.63	.50	.70	.83	<u>.72</u>	.58	.83	.56	.65	.67	.11
31C	.59	.46	<u>.74</u>*	.86	<u>.72</u>	.66	.74	<u>.64</u>	.66	.67	.11
63B	.55	.31	.61	.80	.62	.62	.76*	.38	.47	.57	.15
71L	.45	.50	.54	.76	.63	.47	.59	.59*	<u>.70</u>	.58	.10
88M	<u>.64</u>	.45	.65	.84*	<u>.72</u>	.62*	.80	.55	.63*	.66	.11
91A	.59	.48	.67	.89	<u>.72</u>	.64	<u>.84</u>	.54	.64	.67	.13
95B	.60	<u>.53</u>	.66	.82	<u>.72</u>	.57	.75	.61	.68	.66	.09
Mean	.59	.47	.66	.85	.70	.61	.76	.54	.63		
S.D.	.06	.06	.05	.06	.04	.06	.07	.08	.06		

*Validity coefficient for Batch Z MOS using the equation developed on Batch A MOS that is most similar in terms of ATQ Profile correlation, Mean = .67, S.D. = .10.

general validity for a particular Batch A MOS (existing job) equation. An equation with a relatively high mean and low standard deviation provides generally high validity across all new jobs, while an equation with a relatively low mean and high standard deviation provides generally low validity that varies across new jobs. There is some difference in means (they range from .57 for 63B to .68 for 11B), but the standard deviations are similar. The means and standard deviations of the column coefficients provide information about the relative predictability of the Batch Z MOS (new jobs). 51B and 67N appear to be the most predictable, while 16S appears to be the least predictable.

Table 4.15 presents the validity coefficients when the "General" and cluster equations are applied to the Batch Z MOS. The "appropriate" cluster coefficients (i.e., those found for the cluster to which the Batch Z MOS belongs) are underlined. The appropriate coefficients are the highest of the cluster coefficients for five of the nine MOS (12B, 54B, 67N, 76Y, and 94B). The average appropriate validity coefficient was .68 with a standard deviation of .08, which are the same as the average and standard deviation for the "General" equation.

Table 4.16 presents the validity coefficients for each Batch Z MOS or new job for its "own" empirical equation (the validity coefficient obtained if the validity research could actually be carried out, as it was for these jobs), the Batch A "MOS Match" equation, the appropriate Batch A cluster equation, the Batch A General equation, and the eight forms of the synthetic validity equations. Examination of the row of mean validity coefficients in this table shows that the General and cluster equations provide the highest average validity (0.68), other than the "own" equation, followed by the Batch A "MOS-Match" equation (.67). This is closely followed by the synthetic equations that combine 0-1 or 0-mean attribute weights with MOS mean component weights (.66) and the synthetic equations that combine 0-1 or 0-mean attribute weights with threshold component weights (.65). There is virtually no difference in standard deviations of the validity coefficients; they range from .08 to .10. Thus, all of the transportability methods provide high absolute validities as do several of the synthetic methods, but only Batch A cluster method provides absolute validity as high as the General method.

Table 4.17 shows the absolute and discriminant validity coefficients for all the methods. Note that the discriminant validity for the "own" equation is .05, which we have regarded as the theoretical upper limit for this type of validity. However, the Batch A "MOS-Match" or Batch A Cluster discriminant validity probably more nearly provides the theoretical upper limit for the applied situation for which the transportability and synthetic models are intended, that is, applying information from existing jobs to new jobs for which "own" equations are not available. These two discriminant validity values are .03 and .01.

Examination of Table 4.17 shows that the Batch A "MOS Match" method achieves an appreciable level of discriminant validity (.03). Discriminant validities for the other transportability and synthetic methods range from -.02 to .02. Several methods achieve acceptably high levels of absolute validity. The General and Batch A cluster least squares equations achieve the highest level of absolute validity. The General method requires the collection of no additional data about new jobs, as do all of the other methods, albeit the additional data required of other methods is not tremendously costly (completion of Army Task Questionnaires by 15 to 30 SMEs).

Table 4.15

Validity Coefficients of General and Cluster Least Squares Equations for Predicting Core Technical Proficiency, Developed on Batch A MOS and Applied to Batch Z MOS[1]

	Validity Coefficients For:				
Batch Z MOS	General Equation	Mechanical Equation	Administrative Equation	Combat Equation	Electronics Equation
12B	.65	.64	.60	.64	.61
16S	.51	.41	.54	.52	.48
27E	.74	.66	.71	.73	.71
51B	.87	.79	.86	.88	.78
54B	.74	.68	.72	.73	.70
55B	.69	.67	.64	.69	.64
67N	.78	.77	.73	.77	.70
76Y	.61	.52	.63	.59	.62
94B	.68	.57	.72	.67	.65
Mean	.68	.63	.68	.69	.65
S.D.	.08	.11	.09	.10	.08

Mean of appropriate cluster coefficients (underlined) = .68
S.D. of appropriate cluster coefficients (underlined) = .08

Note. The correlations of the 26 attributes with Core Technical Proficiency for the four clusters (M, A, C, E) were estimated by the pooled correlations of the Batch A MOS in each cluster and, for the General group, by pooling all of the Batch A correlations.

[1]Underlined coefficients indicate the appropriate cluster for each MOS.

Table 4.16

Comparison of Validity Coefficients for Predicting Core Technical Proficiency Obtained for the Nine Project A Batch Z MOS When Using Own Least Squares Equation, the Least Squares Equation for the Batch A MOS That Most Closely Matches the Batch Z MOS, the Appropriate Batch A Cluster, the General Batch A Equation, and Various Synthetically Formed Equations

MOS	"Own" Empirical Equation*	Batch A MOS Match	Batch A Cluster Equation	Batch A General Equation	Mean Attribute Validities & MOS Component Weights	.95 Stepwise Reduction	Top 5 Stepwise Reduction	0-1 Attribute Weights & MOS Mean Component Weights	0-Mean Attribute Weights & MOS Mean Component Weights	Mean Attribute Validities & Threshold Component Weights	0-1 Attribute Weights & Threshold Component Weights	0-Mean Attribute Weights & Threshold Component Weights
12B	.67	.64	.64	.65	.49	.52	.53	.60	.61	.49	.59	.60
16S	.48	.50	.52	.51	.45	.44	.44	.51	.51	.45	.50	.50
27E	.78	.74	.71	.74	.54	.63	.65	.67	.68	.55	.66	.66
51B	.84	.84	.79	.87	.74	.77	.75	.83	.83	.75	.78	.79
54B	.73	.70	.73	.74	.60	.60	.61	.70	.70	.60	.69	.70
55B	.67	.62	.64	.69	.53	.56	.47	.65	.66	.54	.65	.65
67N	.80	.76	.77	.78	.66	.65	.69	.73	.74	.68	.75	.76
76Y	.64	.59	.63	.61	.49	.50	.52	.56	.57	.52	.56	.56
94B	.73	.63	.72	.68	.58	.60	.60	.68	.68	.61	.65	.64
Mean	.70	.67	.68	.68	.56	.59	.58	.66	.66	.58	.65	.65
S.D.	.10	.10	.08	.08	.09	.09	.10	.09	.09	.09	.08	.09

*These values are corrected for shrinkage according to Rozeboom (1978); all other values in the table are cross-validities or based on equations that did not optimize on sample characteristics.

Table 4.17

Absolute and Discriminant Validity Coefficients for Predicting Core Technical Proficiency (Computed Across Nine Batch Z MOS) for Equations Developed from Various Methods

Equation	Absolute Validity	Discriminant Validity
"Own" Least Squares	.70[1]	.05
Batch A "MOS-Match" Least Squares	.67	.03
Batch A Cluster Least Squares	.68	.01
Batch A General Least Squares	.68	.00
Full Synthetic (Mean Attribute Validities and MOS Mean Component Weights)	.56	-.01
Top 5 Stepwise Reduction	.58	-.02
0-1 Attribute Weights	.66	.00
0-Mean Attribute Weights	.66	.00
Threshold Component Weights	.58	.00
0-1 Attribute Weights and Threshold Component Weights	.65	.01
0-Mean Attribute Weights and Threshold Component Weights	.65	.02

[1]The absolute validities for "own" least squares equations were computed on coefficients adjusted with Rozeboom's equation #8 (1978). Other absolute validities were computed on coefficients that did not require adjustments.

Conclusions: Validity of Synthetic Validity Models

We have attempted to identify important points and conclusions throughout this chapter. In this section we discuss the most salient conclusions.

First, and most importantly, synthetic validity methods in almost any form provide acceptably high levels of absolute validity for Core Technical and Overall Performance. The highest

validities are achieved for predicting Core Technical Proficiency in which the attribute-by-component weights are formed by giving zero weight for cells with lower estimates of validity (validity coefficient = .64); the lowest achieved validities are .55 (see Table 4.11). These values compare favorably to validities achieved by using least squares equations developed on the MOS themselves, which are about .67 for Core Technical Proficiency.

Synthetic validity methods show very little discriminant validity, about .01 or .02 for the Core Technical criterion and zero or .01 for the Overall criterion. However, there appears to be no more than .06 discriminant validity available for the Core Technical criterion (see Table 4.11). The comparable value for the Overall criterion is .01. With regard to level of discriminant validity for these data, A. Schwartz (personal communication, August 8, 1990) has completed parallel analyses to those completed on this project, using the ASVAB Aptitude Area Composites as the prediction equations. Figure 4.6 shows 10 Aptitude Area Composites, the ASVAB subtests making up each composite, and the MOS in the synthetic validity project to which the composites are applied. Schwartz computed the absolute and discriminant validities of these Aptitude Area composites for predicting Core Technical Proficiency and obtained values of .65 (absolute validity) and .02 (discriminant validity). Note that the discriminant validity value is the same as that achieved by the best synthetic equation, and the absolute validity falls midway between the synthetic value (.64) and the least squares value for the ASVAB reduction (.66).

In summary, it appears that synthetic validity methods can achieve somewhere in the neighborhood of 96% or greater of the absolute validity achieved by least squares equations developed on the MOS themselves (.64 divided by .67), and about 33% of the discriminant validity obtained by the least squares method (.02 divided by .06).

The most important comparison, in terms of the operational viability of the synthetic methods for the Army, is that of comparing transportability methods to synthetic methods, since one of these two types of methods must be used to develop an equation for a new MOS or an existing MOS for which empirical validation research cannot be completed. The analyses addressing this comparison (see Table 4.17) show that the transportability methods produce absolute and discriminant validities that are as high or higher than the synthetic methods. The Batch A Cluster and Batch A General least squares methods achieved the highest absolute validity (.68). The Batch A cluster method has discriminant validity of .01, while there is zero discriminant validity for the General method, which uses a single least squares equation developed across nine Army MOS. The Batch A "MOS-Match" method achieved absolute validity of .67, only slightly lower than the Cluster and General methods, and achieved the highest discriminant validity (.03) of any synthetic or transportability method investigated. The choice between the

Batch A Cluster and MOS-Match methods hinges on the judgment of whether it is better to have .01 greater absolute validity at the cost of .02 in discriminant validity. Use of either method assumes the appropriate cluster or MOS match for a new MOS can be identified. The method used in this project--obtaining Army Task Questionnaire profiles for new MOS and correlating them with profiles for "existing" MOS--could provide this information.

ASVAB Subtests and Abbreviations

Arithmetic Reasoning (AR)
Auto and Shop Information (AS)
Coding Speed (CS)
Electronics Information (EI)
General Science (GS)
Mechanical Comprehension (MC)
Mathematics Knowledge (MK)
Numerical Operations (NO)
Verbal (VE)

ASVAB AA Composites and Abbreviations	ASVAB Subtests in AA Composites	MOS Chosen with AA Composites
Clerical (CL)	AR + MK + VE	71L, 76Y
Combat (CO)	AR + AS + CS + MC	11B, 12B, 19K
Electronics Repair (EL)	AR + EI + GS + MK	27E
Field Artillery (FA)	AR + CS + MC + MK	13B
General Maintenance (GM)	AS + EI + GS + MK	51B, 55B
General Technical (GT)	AR + VE	---
Mechanical Maintenance (MM)	AS + EI + MC + NO	63B, 67N
Operators/Food (OF)	AS + MC + NO + VE	16S, 88M, 94B
Surveillance/Communication (SC)	AR + AS + MC + VE	31C
Skilled Technical (ST)	GS + MC + MK + VE	54B, 91A, 95B

Figure 4.6. ASVAB subtests, aptitude area (AA) composites, and synthetic validity project MOS chosen with AA composites.

Chapter 5. Standard Setting Instruments

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Phase II results led to several modifications of the standard setting procedures. The Soldier-Based Standard Setting instrument was dropped from consideration. The Critical Incident scale was renamed, and its basis for task dimensions shifted to reflect Army Task Questionnaire content. The Task-Based Standard Setting Questionnaire was extensively overhauled, changing its content to conform to the Army Task Questionnaire, modifying the information presented and the method of presentation, and altering the response format.

The standard setting instruments are designed to obtain standards, not on whole jobs, but on components of the job. For the Phase II instruments, those components were taken from the Hybrid Questionnaire. Phase II results led to the adoption of the Army Task Questionnaire as the recommended job description instrument. Thus, for Phase III, new standard setting dimensions were required. In an attempt to obtain some level of generalizability, Army Task Questionnaire lettered dimensions (see Figure 3.1) were used to define job components rather than the separate task categories. After reviewing the MOS to be included in Phase III, six task dimensions were identified as appropriate for the standard setting exercises. A constraint on dimension selection was that Project A criterion data had to be available for every dimension that was used. The task dimensions and MOS to which they were assigned are presented in Table 5.1. Task dimensions included one that was common to all MOS (Individual Combat). The other dimensions attempted to capture one or two other components of the MOS that are more specific to the content of that MOS.

Both Phase III standard setting instruments are designed to establish performance standards that differentiate four levels of job performance. These levels, identified early in the project, include Unacceptable performance, Marginal performance, Acceptable performance, and Outstanding performance. Figure 5.1 presents their definitions. Notice that the performance levels are defined in terms of the behavior of the soldiers and consequences to the Army.

In the literature cited in Chapter 1 and reviewed for this project by Pulakos, Wise, Arabian, Heon and Delaplane (1989) standard setting procedures are typically applied to a particular test, and standards for that test are the desired end-product. In the context of synthetic validation, standard setting procedures have a much broader focus and are further removed from the eventual end-product. There is no particular performance test that is the focus of attention. Rather, the ultimate focus is on setting cutoffs on predictor tests. Setting job component

Table 5.1

Performance Dimensions for Phase III Standard Setting

Dimension	MOS 12B	13B	27E	29E	31C	31D	51B	54B	55B	95B	96B
B. Electrical & Electronic Main't			X	X	X	X					
D. Vehicle & Equipt. Operations	X	X					X	X	X		
H. Clerical			X						X	X	X
I. Communications				X	X	X				X	X
M. Individual Combat	X	X	X	X	X	X	X	X	X	X	X
N. Crew-served Weapons		X									

Unacceptable:	Soldiers who **consistently** perform like this should not have been selected for this MOS. Their performance is hurting the Army. Additional training would not bring their performance up to acceptable levels.
Marginal:	Soldiers who **consistently** perform like this need extra or remedial training. Their current performance is of little or no benefit to the Army.
Acceptable:	Soldiers who **consistently** perform like this are doing an adequate job. They are making positive contributions to the Army.
Outstanding:	Soldiers who **consistently** perform like this are doing extremely well. They are making exceptional contributions to the Army and are good examples to other soldiers.

Figure 5.1. Performance level definitions for standard setting exercises.

standards is just a step in that direction. Linkage of the job component standards to predictor standards requires that the component standard be expressed in distribution terms rather than in performance score terms. (See Chapter 6.) Thus, the three cutoff points dividing the four levels of performance are most conveniently expressed as percentile scores. For both the Behavioral Incident and Task-Based Standard Setting instruments, SME ratings are expressed as percentiles derived from the distributions of soldier performance obtained in Project A Concurrent Validation. Thus, the Marginal cutoff score is the minimum performance, expressed as a percentile score, needed to be classified as at least Marginal. All scores below that cutoff are less than Marginal; all scores above that cutoff are at least Marginal. Analogous interpretations hold for the other cutoff levels.

The remainder of this chapter will describe the revised instruments, present their reliability estimates, and discuss the standards obtained from them. Chapter 6 of this report describes the linkage of these performance standards to predictor battery standards.

Behavioral Incident Standard Setting Questionnaire

The Behavioral Incident Standard Setting Questionnaire requires respondents to rate samples of job performance as either Unacceptable, Marginal, Acceptable, or Outstanding. The most obvious change to this instrument from Phase II is a change in its name. This standard setting instrument was originally called the Critical Incident Standard Setting Questionnaire because it was developed from Project A critical incidents used in constructing MOS-Specific Behaviorally Anchored Rating Scales (Mos-Specific BARS). However, for use in standard setting, the term "critical" is inappropriate. The incidents are meant to be examples of performance anywhere along the continuum from poor to outstanding. In Phase II, raters had a tendency to focus on each individual incident and as a result had a problem comparing the incidents to the performance level definitions (e.g., a single incident of poor judgment does not make a soldier unacceptable). Therefore, the title of the instrument, as well as the instructions, were changed to emphasize that the each incident should be judged as a representative sample of a pattern of behavior.

Separate Behavioral Incident scales were constructed for the task dimensions identified in Table 5.1. A sample scale may be found in Appendix A, Attachment 2. The complete set of scales is in Volume II. These six dimensions are defined by a varying number of somewhat broad task categories on the Army Task Questionnaire. (See Chapter 3 of this report for a complete description of the Army Task Questionnaire.) For example, Dimension B (Electrical and Electronic Systems Maintenance) is defined by 5 task categories (categories 7 through 11); whereas Dimension M (Individual Combat) is described by 10 task

categories (categories 71 through 80). In selecting incidents for each scale, we examined the critical incidents that were used to construct the Project A MOS-Specific BARS for the nine Batch A MOS. Five factors were considered in selecting items for the Behavioral Incident scales.

1. Comprehensive coverage of the dimension. To ensure adequate coverage of all task categories within a dimension, an equal number of incidents was selected for each task category. Dimension B, for example, consists of five task categories; therefore, four incidents were selected to represent each task category. For Dimension M, which consists of 10 task categories, two incidents were selected to depict each category.

2. Full range of performance effectiveness. Using the mean effectiveness ratings obtained during Project A BARS development, incidents were selected to represent the full range of performance effectiveness. Although it was difficult to find incidents at the midpoint of the scale (i.e., means of 4.0 to 6.0), several incidents were available for selection from the extremes of the scale (i.e., means of 1.0 to 3.0 and 7.0 to 9.0).

3. High rater agreement of performance effectiveness. In addition to effectiveness scale values, we examined interrater agreement. Specifically, effectiveness scale value standard deviations were examined. Incidents with standard deviations greater than 2.0 were avoided; however, five incidents with standard deviations of 2.0 or greater were inadvertently included on three different scales.

4. Representative of a variety of MOS. Where possible, incidents were sampled from as many Batch A MOS as possible. The composition of the dimension controlled this to some extent. For example, Dimensions H (Clerical) and I (Communication) yielded a sample of incidents from almost all nine Batch A MOS. Dimension N (Crew-Served Weapons), on the other hand, was by definition limited to a sample of 13B and 19K incidents.

5. Avoidance of disciplinary incidents. Because the goal of the standard setting exercises is to identify levels of performance on areas of job performance, incidents depicting disciplinary actions were not selected.

Qualitative Feedback

During the Phase III workshops, subject matter experts (SMEs) raised several issues regarding practical aspects of administering both the Behavioral Incident and Task-Based standard setting exercises as well as comments about the instruments themselves. Most of the direct comments from SMEs regarding the Behavioral Incident exercise focused on suggested revisions to the current form. Most raters wanted more information about the soldier depicted in the incident. Specifically, they wanted to replace a single incident with a

short history of the soldier's performance. Because SMEs understood that according to the instructions they were to generalize from a single incident to a soldier who consistently performs in the manner described, the desire for more information does not appear to be due to a misunderstanding of the task they were to perform. The request for additional information seemed to stem from a desire to give Marginal and particularly Unacceptable soldiers "the benefit of the doubt" or "a break." That is, SMEs seemed to be looking for some redeeming qualities of the soldier in every incident. Given that effectiveness ratings are available on single incidents, extending those incidents to short histories is not a viable alternative. However, it may be possible to modify the instructions to provide a better frame of reference to the SMEs. During Phase III, the question raters were to answer for each incident was "If a soldier CONSISTENTLY performed duties in this area at a level of effectiveness like the example incident, what kind of soldier would this be (Unacceptable, Marginal, Acceptable, or Outstanding)?" The "consistency" wording could be suffixed with "In other words, you wouldn't be surprised if an Unacceptable, Marginal, Acceptable, or Outstanding soldier performed in the manner described by the incident." In some of the Phase III workshops, the "you wouldn't be surprised" explanation was used to augment the original instructions, and it seemed to facilitate explanation of the standard setting task.

A second suggested revision targeted the incidents describing fatalities. Dimension M (Individual Combat) included two incidents in which the soldier was killed as a result of his actions. Item 4 (see Appendix A, Attachment 2) depicts a soldier performing a heroic act which results in his death. Item 11 recounts the death of a soldier and his NCOIC as a result of the soldier's careless behavior. In both cases, the items are unanswerable given the "consistently" wording of the instructions. Secondly, the SMEs pointed out that item 4 actually has two outcomes. The heroic act saved several lives, which is an example of Outstanding performance. However, the soldier died, and this is Unacceptable performance. If the Behavioral Incident exercise is to be used in future standard setting workshops, incidents describing fatalities should be replaced, and all incidents should be reviewed to ensure that they portray a single outcome.

Aside from specific comments made by workshop participants, workshop leaders made some general observations about the Behavioral Incident exercise. For the most part, SMEs do not feel that they are setting performance standards with this format. Rather, they feel that they are making decisions about an individual soldier. An underlying assumption of the examinee-based standard setting procedures is that raters are more accustomed to making decisions about individuals than about items; therefore, standard setting procedures should tap that strength by having raters make decisions about individuals. On the other hand, Hambleton (1978) emphasizes the importance of

raters clearly understanding the task they are to perform and how the final standard will be determined. If the Behavioral Incident exercise is used as an operational standard setting procedure, the instructions should be expanded to include the manner in which the data will be used to determine the final standard.

A second observation is that SMEs sometimes have difficulty determining whether they should substitute an MOS-specific incident for the provided incident or use the Cannot Rate option. For example, a 24 month 31C may make minor repairs to a generator, but he or she does not use STE-ICE as illustrated in the incident. Should the soldier described in this incident be rated Outstanding because using STE-ICE is above and beyond what is expected, or should the incident receive a Cannot Rate because 31C technical equipment cannot be substituted for STE-ICE? Frequent selection of the Cannot Rate option may present a scoring problem, especially for incidents with mean effectiveness ratings around the midpoint of the effectiveness scale. As mentioned earlier, a greater number of incidents were available for inclusion on the Behavioral Incident instruments at the extremes of the effectiveness scale than were available around the midpoint. Thus, if several incidents around the effectiveness scale midpoint are scored Cannot Rate, there will be fewer scale values available for setting standards at that point on the scale. Reducing the number of scale values at the midpoint by frequent use of the Cannot Rate option may inadvertently lead to more stringent or more lenient standards than SMEs intended.

Finally, workshop leaders observed that some SMEs make erroneous assumptions about technical equipment mentioned in the incident. For example, an SME may not fully understand how the equipment described operates. In trying to substitute a comparable piece of technical equipment, the SME may assume that the equipment mentioned in the incident is considerably more or less complicated than it actually is. Thus, he may substitute a more or less complex piece of equipment. The effects of these substitution mistakes on performance standards remain unknown.

Data Editing and Scoring Procedures

A two-stage process was used in creating scores for each Behavioral Incident dimension rated by each judge. In the first stage, the effectiveness scale value for each behavioral incident was converted to a percentile score. This process, which involved use of incident effectiveness scale values from Project A retranslation workshops (Toquam et al., 1988) and incumbent ratings from the Project A Concurrent Validation (Young, Houston, Harris, Hoffman, & Wise, 1990), is described below. In the second stage, percentile cut scores were generated from the performance level ratings of the incidents for the dimension. Three cut scores were computed, defining the minimal performance levels for Marginal, Acceptable, and Outstanding performance,

respectively. As described below, two different methods for defining the cut scores were examined. Scores for some combinations of judges and dimensions were dropped at this stage due to missing or inconsistent data.

Conversion to Percentile Scores. Effectiveness scale values for each incident were collected in Project A retranslation workshops using a 9-point scale, with 1 representing extremely ineffective and 9 representing extremely effective performance. Selected incidents were then used as anchors for the MOS-Specific BARS. The BARS used a 7-point scale. The first step in creating percentile scores was to translate the effectiveness scale values to the 7-point scale using the same translation that had been used for the anchor incidents. The translation used was B = .25 + .75*R, where B was the BARS effectiveness level and R was the retranslation effectiveness level on the original 9-point scale.

During Project A development, each incident was sorted into a particular retranslation dimension. (It should be noted that Project A retranslation dimensions, MOS-Specific BARS dimensions, and Behavioral Incident task dimensions are not defined in the same manner. Upon careful review, it can be seen that the retranslation dimensions and BARS dimensions are closely related; while the task dimensions are clearly unique.) In a few cases, retranslation dimensions were combined in forming the MOS-Specific BARS. For each incident in the Behavioral Incident Questionnaire, we converted effectiveness scale values into performance percentiles by computing the percent of incumbents in the Project A Concurrent Validation who had a mean (combined peer and supervisor) effectiveness scale value on the corresponding BARS dimension that was less than the BARS effectiveness scale value for the incident in question. Figure 5.2 shows a plot of the percentile scores by the original effectiveness scale values for each incident. Each incident is plotted with the letter indicating the Army Task Questionnaire dimension it represents.

One concern in the computation of percentile scores for each incident was that the BARS are MOS-specific, and so the percentile scores are derived from nine different MOS. If the original incident effectiveness scale values were on a relative scale (relative to the abilities of the incumbents in a particular MOS), this would not cause a problem--the same relationship between scale value and percentile rank might hold for all dimensions and MOS. If the original effectiveness scale values were more absolute, however, the ability levels of incumbents in different MOS might alter the relationship between scale values and percentile scores. To test this hypothesis, we ran an analysis of covariance examining the relationship between BARS dimension and percentile score controlling for three polynomial levels of effectiveness: mean effectiveness, (effectiveness - 5) squared, and (effectiveness - 5) cubed. We also included the interaction of dimension with mean effectiveness. The results indicated no significant differences in percentile scores associated with BARS dimension or with the

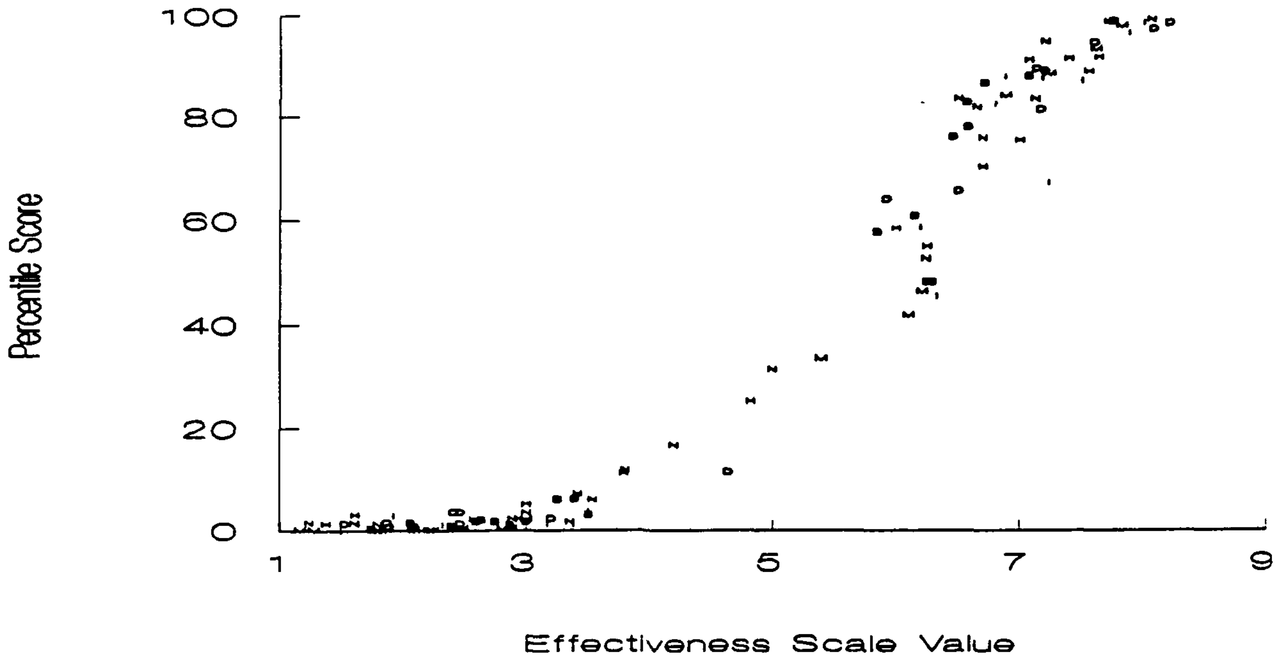

Figure 5.2. Empirical pe: entile scores plotted against behavioral incident effectiveness scale values.

interaction of BARS dimension and effectiveness (p = .87 and .50, respectively). Each of the polynomial terms for effectiveness had a highly significant relationship to percentile scores ($p <$ .0001 in all cases). We thus concluded that differences among BARS dimensions (and hence also among MOS within which the BARS dimensions were nested) could be ignored.[1]

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[1]At first glance, the use of percentile scores (normally associated with a rectangular distribution) in a regression analysis may be questioned. However, it should be pointed out that we are examining the sample of incidents, not the persons who were rated. For the incidents, the distribution of percentile values is not expected to be rectangular. On the other hand, it is not normal either. Because there were few mid-range instances available from the critical incident developmental process, the distribution of incident scale values and incident percentile values, is bimodal. Of course this situation also violates assumptions needed for statistical tests of the relationship between scale value and percentile value. However, describing the relationship between scale value and percentile value for the incidents in terms of a polynomial equation violates no assumptions. Furthermore, the strength of the association combined with the general robustness of regression suggests that our assertion is reasonable: There exists a strong curvilinear relationship between incident scale values and percentile scores.

A subsequent analysis was run, without BARS dimension as a variable, to establish a single equation which would be applicable to all incidents and could be used to translate effectiveness scale values to percentile scores. In that analysis, we found that the fourth-order polynomial term was also significant. This function explained 98% of the variance in the individual empirical percentile estimates. We used these computed scores in preference to the empirical percentile estimates in part because there were five incidents that had been sorted into task dimensions but were not used in creating the MOS-Specific BARS (so no empirical scores were available) and in part as a means of performing a minimal smoothing of the data. The final function used to compute percentile scores was:

P = -.236*(E-5)**4 -.300*(E-5)**3 +5.400*(E-5)**2 +18.01*E -63.78

where E is the incident effectiveness scale value and P the associated percentile score.

<u>Creating Percentile Cut Scores</u>. The second stage in scoring the Behavioral Incident Questionnaire was to convert SMEs' performance level ratings on the incidents to cut scores which indicate the minimum percentile scores for Marginal, Acceptable, and Outstanding performance levels. This conversion was done separately for each judge-by-dimension combination.

Two scoring methods were examined. The first, referred to as the "Average" method, defined each cutoff as the midpoint between the average percentile score for all incidents rated at one level (e.g., Unacceptable) and the average percentile score for all incidents rated at the next higher level (e.g., Marginal). For example, consider Table 5.2 which depicts a completed hypothetical Behavioral Incident Questionnaire for a single judge and a single dimension. In this example, the average percentile score for all incidents rated Unacceptable is 30, average percentile score for all incidents rated Marginal is 49, average percentile for all Acceptable incidents is 74.2, and average for all Outstanding incidents is 87.5. Using the Average scoring method, this judge's cutoff, in percentile scores, for Marginal performance is 39.5, for Acceptable performance is 61.6, and for Outstanding performance is 80.8.

With the Average method if there were no incidents rated as Outstanding, 100 was used as the average rating for Outstanding performance. If no incidents were rated Unacceptable, zero was used as the average rating for Unacceptable performance. If no incidents were rated as Marginal, the midpoint between the averages for Unacceptable and Acceptable was used as the lower limit for both the Marginal and Acceptable performance levels. Similarly, if no incidents were rated as Acceptable, the midpoint between the averages for Marginal and Outstanding was used as the cutoff for both Acceptable and Outstanding.

Table 5.2

Completed Hypothetical Behavioral Incident Questionnaire for a Single Judge's Ratings on a Single Dimension

Incident	Performance Level	Percentile Score
1	Unacceptable	25
2	Unacceptable	25
3	Unacceptable	30
4	Unacceptable	35
5	Unacceptable	35
6	Marginal	45
7	Marginal	45
8	Marginal	50
9	Marginal	50
10	Marginal	55
11	Acceptable	70
12	Acceptable	70
13	Acceptable	75
14	Acceptable	75
15	Acceptable	75
16	Acceptable	80
17	Outstanding	75
18	Outstanding	90
19	Outstanding	90
20	Outstanding	95

The second scoring method, used exclusively in Phase II scoring and herein referred to as the "End-Point" method, defined each cutoff as the midpoint between the maximum percentile score for the incidents rated at one level (e.g., Unacceptable) and the minimum percentile score for the incidents rated at the next higher level (e.g., Marginal). Once again, consider the hypothetical data in Table 5.2. The maximum percentile score for incidents rated Unacceptable is 35, and the minimum percentile score for incidents rated Marginal is 45. Therefore, the cutoff for Marginal performance is 40. Similarly the cutoff that defines Acceptable performance is 62.5. The same computational procedure is used even when there are reversals in the ratings. For the sample data, the highest Acceptable incident is 80, and the lowest Outstanding incident is 75. The cutoff, therefore, is 77.5.

Where the percentile distributions overlap for incidents rated at two different performance levels, the End-Point method will minimize the maximum "error", where error refers to the extent to which an incident at a lower (higher) performance level has a percentile score above (below) the computed cutoff. The Average method, on the other hand, is likely to produce more stable estimates because scores for all items at each performance level are used rather than just one score from each performance level.

In screening the Behavioral Incident Questionnaire data, we eliminated cases where the judge was unable to rate 5 or more of the 20 incidents for a dimension. This resulted in the elimination of data for 78 combinations of judges and dimensions. (For eight judges, two dimensions were dropped, and for five judges three dimensions were dropped. In all other cases, only a single dimension was dropped for any one judge.) We also dropped a few cases where the cut scores were reversed and the difference was more than four standard deviations of the average of the differences between cut scores. This resulted in cases being dropped if the difference between two Average method cut scores was reversed by more than 0.5 percentage points or the difference between two End-Point method cut scores was reversed by more than 2.0 percentage points. Where a case was dropped for either missing data or reversals, all scores were deleted to maintain comparability in the samples used to evaluate the two different methods. (In all, 20 of the 23 cases dropped for reversals were dropped because of reversals in the Marginal and *Acceptable* cut scores computed by the End-Point method). Table 5.3 shows the number of cases dropped for each dimension.

Descriptive Statistics

Table 5.4 presents means and standard deviations across raters for the standards set by each MOS. Results for both scoring methods are presented. It should be noted that these means represent the MOS performance cutoffs and that the standard deviations are one index of within-MOS rater agreement.

MOS statistics (i.e., the MOS means and standard deviations presented in Table 5.4) were averaged, by dimension, across the MOS. Table 5.5 presents a summary of those results. Thus, for Dimension B, four MOS are represented. As calculated by the Average method, the mean for those four MOS cutoffs for Marginal performance is 6.33, and the four MOS cutoffs have a standard deviation of 1.54. Also the means and standard deviations across MOS are presented for the within-MOS standard deviations. Thus, as calculated by the Average method, the mean standard deviation for the Marginal cutoff for the four MOS rating Dimension B is 7.97, and the across-MOS standard deviation of those within-MOS standard deviations is 3.15.

Table 5.3

Number of Behavioral Incident Questionnaires Dropped During Edits

Dimension	Valid	Reason Dropped: Missing	Reason Dropped: Reversals	Total
B. Electrical & Electronic Main't	160	17	1	178
D. Vehicle & Equipt. Operations	351	14	2	367
H. Clerical	210	23	1	234
I. Communications	268	14	1	283
M. Individual Combat	655	10	17	682
N. Crew-served Weapons	72	0	1	73
Total	1716	78	23	1817

Across all 30 MOS and dimension combinations, the cutoffs for the three performance levels are widely spread. Minimum performance for Marginal level is at the 6 to 7 percentile level. Minimum performance for Acceptable level jumps up to 32 percentile based on the End-Point method and 39 percentile for the Average Method. For performance to be considered Outstanding requires percentile scores in the upper 70s. Given the wide spread of the cutoffs across the three levels, the variation in the means across MOS and dimensions seems slight. These differences are explored further below.

There are two perspectives on the meaning of the within-MOS standard deviation. Again considering the wide spread between the performance levels, these within-MOS standard deviations, which average from 7.5 to 18.3 depending on level and scoring method, suggest that raters do not have major disagreements (i.e., one rater's Marginal is not likely to be another rater's Outstanding). However, focusing on any one cutoff, these standard deviations appear rather large, particularly for the Marginal and Outstanding percentile cutoffs. At these extremes, percentile differences on the order of 10 points or so would be translated into sizable test score differences. However, standards will not be based on a single rater, and the more

Table 5.4

Behavioral Incident Standard Setting Questionnaire: Cutoff Scores for Two Scoring Methods by MOS and Dimension

			Average Method Cutoffs						End-Point Method Cutoffs					
			Marginal		Acceptable		Outstanding		Marginal		Acceptable		Outstanding	
MOS	Dimension	N	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
12B	D	81	6.66	9.30	42.19	8.91	81.37	7.80	7.03	12.38	30.46	20.88	85.55	10.23
	M	80	6.36	8.34	38.92	8.92	78.78	13.18	6.85	13.04	36.83	22.17	80.92	14.55
13B	D	72	7.23	8.20	40.42	9.74	77.87	11.87	6.57	8.79	30.91	17.79	79.20	15.43
	M	72	6.93	9.71	38.44	9.17	74.46	14.58	11.02	17.12	33.37	22.70	75.88	20.60
	N	72	7.14	5.73	41.11	7.27	80.80	13.66	9.28	9.43	39.75	15.22	84.54	17.18
27E	B	31	7.81	9.38	33.70	6.02	72.09	12.68	9.10	13.90	29.55	18.48	76.35	13.76
	H	29	4.17	4.65	37.97	5.88	77.31	8.96	3.97	6.60	23.10	17.03	83.37	11.99
	M	29	6.82	6.30	38.33	10.46	73.62	13.23	5.86	10.16	39.38	21.35	76.19	18.40
29E	B	44	6.79	10.50	36.16	9.08	73.45	13.55	7.38	12.40	30.80	14.67	73.73	18.31
	I	48	6.50	9.89	40.24	7.36	80.89	11.44	5.05	8.93	33.58	17.75	81.13	15.38
	M	48	7.73	9.51	39.04	8.86	80.73	16.98	13.63	18.52	34.98	19.72	82.84	19.11
31C	B	69	6.54	8.60	34.80	6.45	70.37	9.65	6.12	9.71	28.81	17.48	72.38	11.23
	I	72	9.07	11.98	43.25	8.81	82.56	8.00	8.19	14.30	40.30	20.11	83.29	11.85
	M	76	6.13	7.56	39.68	6.87	78.96	14.99	10.28	15.08	36.73	17.72	81.24	17.78
31D	B	16	4.16	3.38	34.74	5.34	67.98	11.81	5.14	11.66	30.14	20.80	70.15	11.56
	I	16	3.49	4.20	40.78	5.87	77.40	12.34	2.37	1.02	34.73	14.99	76.96	12.76
	M	17	4.61	7.26	38.52	12.41	67.52	16.41	8.45	13.37	29.01	20.38	68.66	23.81
51B	D	73	6.68	7.22	42.03	7.18	81.72	10.02	5.70	8.79	33.78	19.50	85.78	12.75
	M	77	4.92	5.96	36.33	10.10	75.91	12.59	9.49	14.77	30.19	18.31	79.42	15.19
54B	D	68	7.80	9.01	43.03	7.99	82.68	12.25	5.70	9.50	35.76	17.98	84.46	17.13
	M	70	6.86	8.83	39.01	8.60	79.26	15.97	15.44	20.55	35.87	19.08	81.63	19.85
55B	D	57	7.70	8.52	41.49	7.97	78.75	13.35	7.25	11.44	33.26	17.54	80.87	16.45
	H	58	5.69	6.76	36.58	9.74	75.92	14.93	4.25	6.70	25.31	18.20	77.40	22.34
	M	57	6.37	8.24	36.39	12.00	70.73	15.91	8.18	13.50	32.19	20.39	70.37	23.51

(table continues)

Table 5.4 (continued)

			Average Method Cutoffs						End-Point Method Cutoffs					
			Marginal		Acceptable		Outstanding		Marginal		Acceptable		Outstanding	
MOS	Dimension	N	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
95B	H	62	4.43	6.03	37.75	4.91	80.34	11.04	5.11	8.39	24.30	12.12	83.05	15.26
	I	75	4.41	7.41	40.35	5.01	83.71	6.89	3.52	5.98	33.15	13.58	84.93	10.71
	M	74	5.44	7.12	39.48	8.17	79.65	14.00	11.56	18.20	32.64	20.10	82.83	18.70
96B	H	61	4.77	5.78	37.23	6.23	77.88	10.99	3.29	5.77	26.06	17.26	82.91	15.88
	I	57	4.19	6.10	40.57	7.27	83.58	7.87	2.92	4.08	36.61	16.75	86.49	11.60
	M	55	3.43	3.82	38.68	7.53	80.76	12.41	6.60	11.65	30.11	17.88	83.04	15.86

Note. Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

Table 5.5

Behavioral Incident Standard Setting Questionnaire: Means and Standard Deviations Across MOS of within MOS Statistics by Dimension and Method

			Within MOS Statistics											
			Average Method						End-Point Method					
			Marginal		Acceptable		Outstanding		Marginal		Acceptable		Outstanding	
Dimension	Across MOS Stats		X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
B	N=4	X:	6.33	7.97	[illegible]	6.72	70.97	11.92	6.94	11.92	29.83	17.86	73.15	13.72
		SD:	1.54	3.15	[illegible]	1.64	2.36	1.67	1.71	1.74	0.85	2.54	2.59	3.26
D	N=5	X:	7.21	8.45	41.83	8.36	80.48	11.06	6.45	10.18	32.83	18.74	83.17	14.40
		SD:	0.54	0.81	0.96	0.99	2.06	2.18	0.73	1.64	2.18	1.42	2.97	2.86
H	N=4	X:	4.77	5.81	37.38	6.69	77.86	11.48	4.16	6.87	24.69	16.15	81.68	16.37
		SD:	0.66	0.88	0.62	2.11	1.85	2.50	0.75	1.10	1.28	2.74	2.86	4.33
I	N=5	X:	5.53	7.92	[illegible]	6.86	81.63	9.31	4.41	6.86	35.67	16.64	82.57	12.46
		SD:	2.27	3.07	[illegible]	1.47	2.62	2.42	2.34	5.06	2.91	2.52	3.72	1.79
M	N=11	X:	5.96	7.51	[illegible]	9.37	76.40	14.57	9.76	15.09	33.75	19.98	78.46	18.85
		SD:	1.25	1.72	1.11	1.73	4.38	1.61	3.00	3.18	3.29	1.66	5.07	3.04
N	N=1	X:	7.14	5.73	41.11	7.27	80.80	13.66	9.28	9.43	39.75	15.22	84.54	17.18
		SD:	-	-	-	-	-	-	-	-	-	-	-	-
ALL DIMENSIONS														
	N=30	X:	6.03	7.51	38.91	8.00	77.57	12.31	7.18	11.19	32.39	18.26	79.85	15.97

Note. MOS are the cases; means and standard deviations for ratings within each MOS (represented by the columns) are the variables.
Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

appropriate statistic to consider is the standard error of the mean. If we project using 60 raters to set standards, as suggested in Chapter 3 to insure representativeness, then standard deviations of 7.5 to 18.3 result in standard errors of the mean of 1.0 to 1.6 for the Average scoring method and 1.4 to 2.4 for the End-Point scoring method.

One other observation may be made concerning these statistics. The Marginal cutoffs, by either method, suggest that, on the average, currently 6 to 7% of the soldier population is Unacceptable and should not be in the MOS. In some of the workshops, SMEs had some problems understanding this category. That is, they would argue that if a soldier were Unacceptable he or she wouldn't be in the Army. We sometimes augmented the description by calling these Unacceptable soldiers selection mistakes. From these data, the collection of SMEs that originally provided the Project A scale development effectiveness values, those that gave BARS ratings to soldiers during Project A concurrent validation, and those that participated in the synthetic validity workshops recognize that such mistakes exist. On the other side of the coin, this system leads to the conclusion that upwards of 20 to 25% of soldiers are "making exceptional contributions to the Army" as Outstanding soldiers.

Scoring method differences. Tables 5.4 and 5.5 suggest that the two scoring methods are not congruent, particularly with regard to rater agreement. Table 5.6 presents tests of the differences among cutoff means and within-MOS agreement (i.e., standard deviations) for the two scoring methods. The data from Table 5.5 were treated as repeated measures data with the MOS-by-dimension combinations as cases and the scoring methods as repeated "trials." Within-MOS means and standard deviations were tested separately. Planned orthogonal contrasts were set up to compare means and standard deviations for each of the three cutoffs. Each of the six comparisons was statistically significant. The bottom row of Table 5.6 indicates that, compared to the End-Point method, the Average method of scoring the Behavioral Incident data led to lower cutoffs for Marginal and Outstanding performance but a higher cutoff for Acceptable performance. More important, the Average method produced lower within-MOS standard deviations, indicative of higher agreement among raters. This latter effect may be due to the Average method smoothing out aberrant ratings on single incidents which unduly influence scoring under the End-Point method.

Table 5.6

Planned Comparison for Scoring Method Effects on MOS Cut Score Means and Variances Using Repeated Measures ANOVA

Source	SS	df	MS	*F*	*p*
Scoring Effect on Cut Score Means:					
Marginal Cut	39.606	1	39.606	5.329	0.028
Error	215.519	29	7.432		
Acceptable Cut	1274.660	1	1274.660	94.764	0.000
Error	390.078	29	13.451		
Outstanding Cut	156.682	1	156.682	67.196	0.000
Error	67.620	29	2.332		
Scoring Effect on Cut Score Standard Deviations: (within-MOS variation)					
Marginal Cut	406.566	1	406.566	26.341	0.000
Error	447.616	29	15.435		
Acceptable Cut	3158.233	1	3158.233	712.555	0.000
Error	128.536	29	4.432		
Outstanding Cut	401.941	1	401.941	109.326	0.000
Error	106.619	29	3.677		

Note. Each MOS-by-Dimension combination is a case; means and standard deviations for ratings within each MOS are the variables.

Behavioral Incident Reliability Estimates

Reliability estimates were computed for each rater group (e.g., TRADOC NCOs, TRADOC Officers), for rater groups combined within command (e.g., TRADOC total), for rater groups combined across commands (e.g., combined NCOs), and for all raters across rank and command. The reliability estimation procedure was identical to that used for the Army Task Questionnaire. Separate estimates were computed for each dimension rated within each MOS and for each scoring method. Table 5.7 presents single-rater and overall reliability estimates for cutoffs from the Average scoring method, and Table 5.8 presents single-rater and overall reliability estimates for cutoffs produced by the End-Point scoring method. Single-rater reliability estimates are used in

Table 5.7

Behavioral Incident Standard Setting Questionnaire: Reliability Estimates for "Average" Scoring Method

MOS	Dimension	Single-Rater Reliability Estimates: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{tt} With All Raters
12B	M	.36	.62	-	.51	.65	.77	-	.71	.57	.72	-	.64	.99
	N of cases	12	13	2	27	30	23	0	53	42	36	2	80	
	D	.74	.93	-	.74	.71	.91	-	.78	.72	.92	-	.76	.99
	N of cases	12	13	2	27	31	23	0	54	43	36	2	81	
13B	M	.57	.72	.75	.68	.48	.69	-	.55	.48	.70	.75	.58	.99
	N of cases	8	6	6	20	29	23	0	52	37	29	6	72	
	D	.34	.59	.77	.55	.65	.79	-	.71	.56	.76	.77	.66	.99
	N of cases	8	6	6	20	28	24	0	52	36	30	6	72	
	N	.35	.96	.55	.48	.83	.81	-	.82	.65	.83	.55	.71	.99
	N of cases	8	6	6	20	28	24	0	52	36	30	6	72	
27E	M	.59	-	-	.60	.62	-	-	.64	.60	-	-	.63	.98
	N of cases	13	0	2	15	12	2	0	14	25	2	2	29	
	H	.75	-	-	.76	.94	-	-	.94	.84	-	-	.83	.99
	N of cases	12	0	3	15	13	1	0	14	25	1	3	29	
	B	.45	-	-	.41	.75	-	-	.78	.60	-	-	.58	.98
	N of cases	12	0	3	15	14	2	0	16	26	2	3	31	
29E	M	.48	-	-	.56	.48	.66	-	.52	.50	.64	-	.54	.98
	N of cases	10	2	3	15	27	6	0	33	37	8	3	48	
	I	.54	-	-	.55	.74	.98	-	.78	.68	.91	-	.69	.99
	N of cases	12	2	3	17	26	5	0	31	38	7	3	48	
	B	.34	-	-	.42	.65	.70	-	.66	.54	.74	-	.57	.98
	N of cases	12	1	3	16	23	5	0	28	35	6	3	44	

(table continues)

Table 5.7 (continued)

MOS	Dimension	TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{11} With All Raters
		Single-Rater Reliability Estimates												
31C	M	.72	.68	-	.72	.62	.60	-	.62	.66	.63	-	.66	.99
	N of cases	15	11	1	27	27	22	0	49	42	33	1	76	
	I	.67	.71	-	.70	.69	.81	-	.74	.69	.77	-	.73	.99
	N of cases	13	10	1	24	26	22	0	48	39	32	1	72	
	B	.78	.64	-	.72	.62	.82	-	.71	.67	.75	-	.71	.99
	N of cases	12	11	1	24	25	20	0	45	37	31	1	69	
31D	M	.60	-	-	.60	-	-	-	-	.60	-	-	.60	.99
	N of cases	15	1	1	17	0	0	0	0	15	1	1	17	
	I	.93	-	-	.80	-	-	-	-	.93	-	-	.80	.98
	N of cases	14	1	1	16	0	0	0	0	14	1	1	16	
	B	.82	-	-	.77	-	-	-	-	.82	-	-	.77	.98
	N of cases	14	1	1	16	0	0	0	0	14	1	1	16	
51B	M	.65	.82	.75	.75	.53	.67	-	.58	.56	.72	.75	.64	.99
	N of cases	11	11	6	28	28	21	0	49	39	32	6	77	
	D	.74	.84	.54	.73	.69	.95	-	.80	.71	.92	.54	.77	.99
	N of cases	12	11	6	29	24	20	0	44	36	31	6	73	
54B	M	.64	.64	-	.66	.49	.67	-	.55	.54	.66	-	.59	.99
	N of cases	14	13	2	29	26	15	0	41	40	28	2	70	
	D	.71	.62	-	.69	.77	.66	-	.73	.75	.65	-	.72	.99
	N of cases	13	13	2	28	25	15	0	40	38	28	2	68	
55B	M	.62	.76	.29	.55	.50	.55	-	.51	.53	.65	.29	.53	.98
	N of cases	13	5	4	22	28	7	0	35	41	12	4	57	
	D	.58	.98	.73	.70	.63	.80	-	.65	.62	.80	.73	.67	.99
	N of cases	12	4	6	22	28	7	0	35	40	11	6	57	
	H	.40	.85	.41	.50	.64	.74	-	.65	.56	.77	.41	.59	.99
	N of cases	13	5	6	24	27	7	0	34	40	12	6	58	

(table continues)

Table 5.7 (continued)

MOS	Dimension	Single-Rater Reliability Estimates: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{ii} With All Raters
95B	M	.57	.85	-	.66	.59	.80	-	.67	.59	.80	-	.67	.99
	N of cases	15	10	0	25	28	21	0	49	43	31	0	74	
	I	.85	.96	-	.90	.76	.93	-	.83	.79	.94	-	.85	.99
	N of cases	15	11	0	26	28	21	0	49	43	32	0	75	
	H	.81	.89	-	.85	.70	.73	-	.72	.75	.79	-	.77	.99
	N of cases	13	10	0	23	19	20	0	39	32	30	0	62	
96B	M	.74	-	.71	.73	.75	.83	-	.77	.75	.83	.60	.75	.99
	N of cases	14	0	4	18	24	12	1	37	38	12	5	55	
	I	.68	-	-	.71	.94	.84	-	.90	.83	.84	.88	.83	.99
	N of cases	16	0	3	19	25	12	1	38	41	12	4	57	
	H	.67	-	.60	.65	.79	.82	-	.80	.75	.82	.63	.75	.99
	N of cases	18	0	4	22	26	12	1	39	44	12	5	61	

Note. Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

Table 5.8

Behavioral Incident Standard Setting Questionnaire: Reliability Estimates for "End-Point" Scoring Method

MOS	Dimension	Single-Rater Reliability Estimates: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{ii} With All Raters
12B	M	.29	.24	-	.24	.39	.46	-	.43	.36	.39	-	.36	.98
	N of cases	12	13	2	27	30	23	0	53	42	36	2	80	
	D	.23	.40	-	.27	.36	.36	-	.35	.32	.39	-	.32	.98
	N of cases	12	13	2	27	31	23	0	54	43	36	2	81	
13B	M	.20	.14	.16	.09	.18	.31	-	.22	.14	.28	.16	.18	.94
	N of cases	8	6	6	20	29	23	0	52	37	29	6	72	
	D	.05	.34	.49	.25	.34	.47	-	.40	.25	.41	.49	.34	.97
	N of cases	8	6	6	20	28	24	0	52	36	30	6	72	
	N	.12	.85	.34	.24	.66	.54	-	.60	.41	.60	.34	.49	.98
	N of cases	8	6	6	20	28	24	0	52	36	30	6	72	
27E	M	.32	-	-	.37	.41	-	-	.41	.36	-	-	.40	.95
	N of cases	13	0	2	15	12	2	0	14	25	2	2	29	
	H	.30	-	-	.36	.23	-	-	.24	.28	-	-	.30	.93
	N of cases	12	0	3	15	13	1	0	14	25	1	3	29	
	B	.28	-	-	.23	.32	-	-	.35	.27	-	-	.24	.91
	N of cases	12	0	3	15	14	2	0	16	26	2	3	31	
29E	M	.42	-	-	.34	.14	.23	-	.15	.21	.11	-	.21	.93
	N of cases	10	2	3	15	27	6	0	33	37	8	3	48	
	I	.27	-	-	.29	.45	.72	-	.50	.40	.59	-	.42	.97
	N of cases	12	2	3	17	26	5	0	31	38	7	3	48	
	B	.26	-	-	.23	.37	.31	-	.37	.34	.36	-	.32	.95
	N of cases	12	1	3	16	23	5	0	28	35	6	3	44	

(table continues)

Table 5.8 (continued)

MOS	Dimension	TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{11} With All Raters
		Single-Rater Reliability Estimates												
31C	M	.24	.10	-	.20	.44	.36	-	.41	.36	.27	-	.32	.97
	N of cases	15	11	1	27	27	22	0	49	42	33	1	76	
	I	.46	.55	-	.51	.44	.43	-	.43	.46	.47	-	.46	.98
	N of cases	13	10	1	24	26	22	0	48	39	32	1	72	
	B	.39	.37	-	.41	.32	.58	-	.43	.34	.48	-	.41	.98
	N of cases	12	11	1	24	.25	20	0	45	37	31	1	69	
31D	M	.19	-	-	.22	-	-	-	-	.19	-	-	.22	.83
	N of cases	15	1	1	17	0	0	0	0	15	1	1	17	
	I	.75	-	-	.60	-	-	-	-	.75	-	-	.60	.96
	N of cases	14	1	1	16	0	0	0	0	14	1	1	16	
	B	.45	-	-	.38	-	-	-	-	.45	-	-	.38	.91
	N of cases	14	1	1	16	0	0	0	0	14	1	1	16	
51B	M	.17	.44	.09	.25	.21	.23	-	.22	.21	.32	.09	.23	.96
	N of cases	11	11	6	28	28	21	0	49	39	32	6	77	
	D	.47	.47	.22	.41	.33	.57	-	.44	.38	.55	.22	.43	.98
	N of cases	12	11	6	29	24	20	0	44	36	31	6	73	
54B	M	.26	.28	-	.23	.14	.15	-	.16	.18	.21	-	.19	.94
	N of cases	14	13	2	29	26	15	0	41	40	28	2	70	
	D	.57	.33	-	.46	.45	.35	-	.41	.49	.35	-	.44	.98
	N of cases	13	13	2	28	25	15	0	40	38	28	2	68	
55B	M	.40	.15	.06	.27	.23	.26	-	.21	.26	.22	.06	.24	.95
	N of cases	13	5	4	22	28	7	0	35	41	12	4	57	
	D	.37	.71	.42	.44	.30	.48	-	.28	.32	.44	.42	.35	.97
	N of cases	12	4	6	22	28	7	0	35	40	11	6	57	
	H	.23	.13	.30	.27	.22	.27	-	.23	.23	.23	.30	.25	.95
	N of cases	13	5	6	24	27	7	0	34	40	12	6	58	

(table continues)

Table 5.8 (continued)

MOS	Dimension	TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{11} With All Raters
95B	M	.07	.39	-	.17	.19	.21	-	.20	.16	.26	-	.19	.95
	N of cases	15	10	0	25	28	21	0	49	43	31	0	74	
	I	.76	.71	-	.74	.40	.82	-	.54	.50	.75	-	.59	.99
	N of cases	15	11	0	26	28	21	0	49	43	32	0	75	
	H	.43	.52	-	.45	.20	.30	-	.26	.29	.35	-	.32	.97
	N of cases	13	10	0	23	19	20	0	39	32	30	0	62	
96B	M	.33	-	.33	.33	.32	.34	-	.32	.32	.34	.16	.30	.96
	N of cases	14	0	4	18	24	12	1	37	38	12	5	55	
	I	.48	-	-	.51	.69	.66	-	.66	.58	.66	.63	.60	.99
	N of cases	16	0	3	19	25	12	1	38	41	12	4	57	
	H	.26	-	.19	.25	.40	.42	-	.40	.35	.42	.14	.33	.97
	N of cases	18	0	4	22	26	12	1	39	44	12	5	61	

Note. Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

order to compare different MOS, dimensions, and rater groups. The last column in each table presents reliability estimates for cutoffs calculated using all available raters. Tables 5.9 and 5.10 present means for the single-rater reliability estimates, first by dimension across the relevant MOS, and then across all MOS-by-dimension combinations.

Several observations may be made. First, the difference between the scoring methods in rater agreement that appeared in the within-MOS standard deviations is apparent. Single-rater reliability estimates for the Average scoring method are about twice as large as those for the End-Point scoring method. For a sample of only 10 raters, one would expect Behavioral Incident reliabilities to exceed .95 when scored by the Average method and .84 when scored by the End-Point method. Using a reliability criterion, the Average method of scoring the Behavioral Incident data is superior to the End-Point method. The magnitude of the difference suggests that the End-Point method be considered no further.

Second, reliability estimates for raters combined across rank and command do not appear to be systematically less than the reliabilities of the separate groups with the exception of the Officers. Officer reliabilities appear somewhat higher. Using the reliability estimates from Table 5.7 for the Average scoring method as dependent variables, differences by rank, command, and dimension were tested with a series of ANOVAs. Rank differences were tested using the combined command reliabilities (columns 8, 9, and 10 in the tables) with preplanned $\underline{F}$ comparisons. Officers were more reliable than NCOs ($\underline{F}_{1,62} = 12.06$, $\underline{p} < .01$) and Civilians were less reliable than NCOs or Officers ($\underline{F}_{1,62} = 5.17$, $\underline{p} < .05$). Multiple $\underline{R}$ for the overall rank effects was .16 indicating that the rank differences in reliability, although detectable, were not very strong. Command differences (comparing columns 4 and 7 in Table 5.7) were not significant. Further tests of rank and command differences are presented below.

A third comparison among the reliability estimates concerns the dimensions. The last column in summary Table 5.9 suggests variation across the dimension. Dimension differences are significant ($\underline{F}_{5,24} = 4.08$, $\underline{p} < .01$) with a Multiple $\underline{R}$ for the dimension effect of .68. Single-rater reliability estimates vary from .62 for Individual Combat to .78 for Communication.

Finally, the strength of these reliabilities may provide a false sense of security. Reliability is as much a function of "true score" variance as error variance; Brennan (1983) suggests thinking in terms of signal to noise ratio. Our objects of measurement--the three cutoff levels--vary widely. They have a "strong signal" which can tolerate a lot of noise, so that we are not going to confuse the Marginal cutoff with the Acceptable cutoff. On the other hand, we still need to be concerned about

Table 5.9

Behavioral Incident Standard Setting Questionnaire: Mean Reliabilities by Dimension for "Average" Scoring Method

Dimension	TRADOC				FORSCOM				COMBINED			
	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT
B	.60	.64	-	.58	.67	.76	-	.71	.66	.74	-	.66
N of cases	4	1	0	4	3	2	0	3	4	3	0	4
D	.62	.79	.68	.68	.69	.82	-	.73	.67	.81	.68	.72
N of cases	5	5	3	5	5	5	0	5	5	5	3	5
H	.66	.87	.51	.69	.77	.76	-	.78	.72	.79	.52	.73
N of cases	4	2	2	4	4	3	0	4	4	3	2	4
I	.73	.83	-	.73	.78	.89	-	.81	.78	.86	.88	.78
N of cases	5	2	0	5	4	4	0	4	5	4	1	5
M	.59	.73	.63	.64	.57	.69	-	.61	.58	.71	.60	.62
N of cases	11	7	4	11	10	9	0	10	11	9	4	11
N	.35	.96	.55	.48	.83	.81	-	.82	.65	.83	.55	.71
N of cases	1	1	1	1	1	1	0	1	1	1	1	1
TOTAL	.62	.78	.61	.65	.67	.77	-	.71	.66	.77	.63	.69
N of cases	30	18	10	30	27	24	0	27	30	24	11	30

Note. N = Number of MOS for which reliability estimates were available.
Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

Table 5.10

Behavioral Incident Standard Setting Questionnaire: Mean Reliabilities by Dimension for "End-Point" Scoring Method

Dimension	TRADOC				FORSCOM				COMBINED			
	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT
B	.35	.37	-	.31	.33	.45	-	.38	.35	.42	-	.34
N of cases	4	1	0	4	3	2	0	3	4	2	0	4
D	.34	.45	.38	.37	.35	.44	-	.38	.35	.43	.38	.38
N of cases	5	5	3	5	5	5	0	3	5	5	3	5
H	.31	.32	.24	.33	.26	.33	-	.28	.29	.33	.22	.30
N of cases	4	2	2	4	4	3	0	4	4	3	2	4
I	.54	.63	-	.53	.49	.66	-	.53	.54	.62	.63	.53
N of cases	5	2	0	5	4	4	0	4	5	4	1	5
M	.26	.25	.16	.25	.26	.28	-	.27	.25	.27	.12	.26
N of cases	11	7	4	11	10	9	0	11	11	9	4	11
N	.12	.85	.34	.24	.65	.54	-	.60	.41	.60	.34	.49
N of cases	1	1	1	1	1	1	0	1	1	1	1	1
TOTAL	.33	.40	.26	.33	.34	.41	-	.36	.34	.39	.27	.35
N of cases	30	18	10	30	27	24	-	27	30	24	11	30

Note. N = Number of MOS for which reliability estimates were available.
Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
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the precision that can be provided by the instrument for *each* cutoff. We can obtain a summary estimate of the error around each cutoff by using the standard deviation of mean cutoffs across all MOS and dimensions (6.03, 38.91, and 77.57). The standard deviation of these three cutoffs is 29.23. Based on our projection of 60 raters and the overall average single-rater reliability of .69, the standard error of the measurement for each cutoff is projected to be 2.5. This error estimate is slightly higher than the those provided by the standard error of the mean calculations (i.e., 1.0 to 1.6). The discrepancy may arise because we are using averages of cutoffs, averages of standard deviations, and averages of reliabilities to make our error projections for the instrument as a whole.

Differences Among Standard Setting Cutoffs

For Behavioral Incident standards, there are four variables that may potentially impact on the standard setting results. These include potential rater group differences of rank and command, differences among the MOS, and differences among the various task dimensions. This section examines these potential differences using only the cutoffs produced by the Average scoring method.

The effects of the four identified variables on the three cutoff points (i.e., percent performing below Marginal, below Acceptable, and below Outstanding) were tested simultaneously using each rater-by-dimension response set as a case and the three standard cutoff points as repeated observations. Using repeated measures ANOVA with three "trials" and four grouping factors, the between-subjects results provide a test of overall differences in strictness or leniency between MOS, between dimensions, between ranks, and between commands. The within-subjects interactions test the consistency of the effects of those variables across the three cutoff points. Civilians were excluded from this analysis because of their small number and uneven distribution across the MOS. Table 5.11 presents the results of the repeated measures ANOVA. Both between- and within-subjects effects are present for MOS and dimension. Within-subjects effects are also significant for rank-by-level effects. Command differences do not appear.

Because of the within-subjects interaction effects for MOS, task dimension, and rank, separate ANOVAs were run for each performance cutoff. These results are presented in Table 5.12. MOS is the only variable that appears to influence each performance level cutoff. Task dimension differences effect only the Acceptable and Outstanding categories, and based on the sums-of-squares, dimension differences have the greatest impact on the standards. The effects of rater rank are found only for the Marginal cutoff. Multiple $\underline{R}$s for these effects on the

Table 5.11

MOS, Task Dimension, Rater Rank, and Rater Command Effects on Three Levels of Behavioral Incident Standards

SOURCE	SS	df	MS	*F*	*p*
Between-Subjects Effects:					
MOS	4623.267	10	462.327	3.313	0.000
Dimension	13157.101	5	2631.420	18.854	0.000
Rank	307.410	1	307.410	2.203	0.138
Command	0.001	1	0.001	0.000	0.998
Subjects w. groups	224287.387	1607	139.569		
Within-Subjects Effects:					
Level	1923856.705	2	961928.353	13692.459	0.000
MOS x Level	4915.872	20	245.794	3.499	0.000
Dimension x Level	5674.553	10	567.455	8.077	0.000
Rank x Level	1743.440	2	871.720	12.408	0.000
Command x Level	268.257	2	134.129	1.909	0.140
Level x Subj. w. groups	225791.271	3214	70.252		

Marginal, Acceptable and Outstanding levels are .19, .27, and .29, respectively. These Multiple *R*s suggest that the magnitude of the MOS, dimension, or rank effects is not large.

Figures 5.3, 5.4, and 5.5 graphically depict the results presented in Table 5.12. Figure 5.3 shows the standards for each MOS that result when standards are averaged for the dimensions that are relevant to the MOS. Similarly, Figure 5.4 shows the standards for each dimension that result when standards are averaged across the MOS that rated the dimension. Finally, Figure 5.5 presents standards set by NCOs and Officers averaged across all of the MOS and dimensions. Except for the Outstanding level, MOS and task dimension differences are rather unremarkable. For all levels, the NCO and Officer differences do not appear striking. Thus, although the ANOVAs present statistically significant differences among the standards by MOS, dimension, and rank, the size of the Multiple *R*s and the graphic presentation of those differences suggest that in practical terms the differences may not be very meaningful.

Table 5.12

MOS, Task Dimension, Rater Rank, and Rater Command Effects on Each Level of Behavioral Incident Standards

Source	SS	df	MS	*F*	*p*
Marginal Cutoff:					
MOS	1798.773	10	179.877	2.920	0.001
Dimension	144.678	5	28.936	0.470	0.799
Rank	1559.485	1	1559.485	25.317	0.000
Error	99050.685	1608	61.599		
Acceptable Cutoff:					
MOS	1240.026	10	124.003	1.865	0.046
Dimension	6600.242	5	1320.048	19.853	0.000
Rank	118.472	1	118.472	1.782	0.182
Error	106916.619	1608	66.490		
Outstanding Cutoff:					
MOS	6535.643	10	653.564	4.300	0.000
Dimension	12085.525	5	2417.105	15.904	0.000
Rank	400.007	1	400.007	2.632	0.105
Error	244379.611	1608	151.977		

Task-Based Standard Setting Form

The Task-Based Standard Setting Form attempts to obtain cutoffs between Unacceptable, Marginal, Acceptable, and Outstanding performance on task dimensions by using samples of tasks as the bases of judgment. Several versions of this approach were used in Phase II, and all of them revolved around matching cutoffs to test scores on hands-on tests of the tasks. For the Phase III version of the instrument, raters were presented one of the easier formats which asked them to simply indicate which test scores reflected the minimum level of performance for Marginal, Acceptable, and Outstanding performance. In contrast to the "detailed" methods from Phase II, no specific information was given about the tests themselves. For Phase III, raters were, however, given information about distributions of performance on the sample tasks.

For each dimension of job performance on which Phase III standards were to be set, a separate one page Task-Based instrument was prepared. From the pool of tasks with Project A hands-on performance tests, tasks were identified that

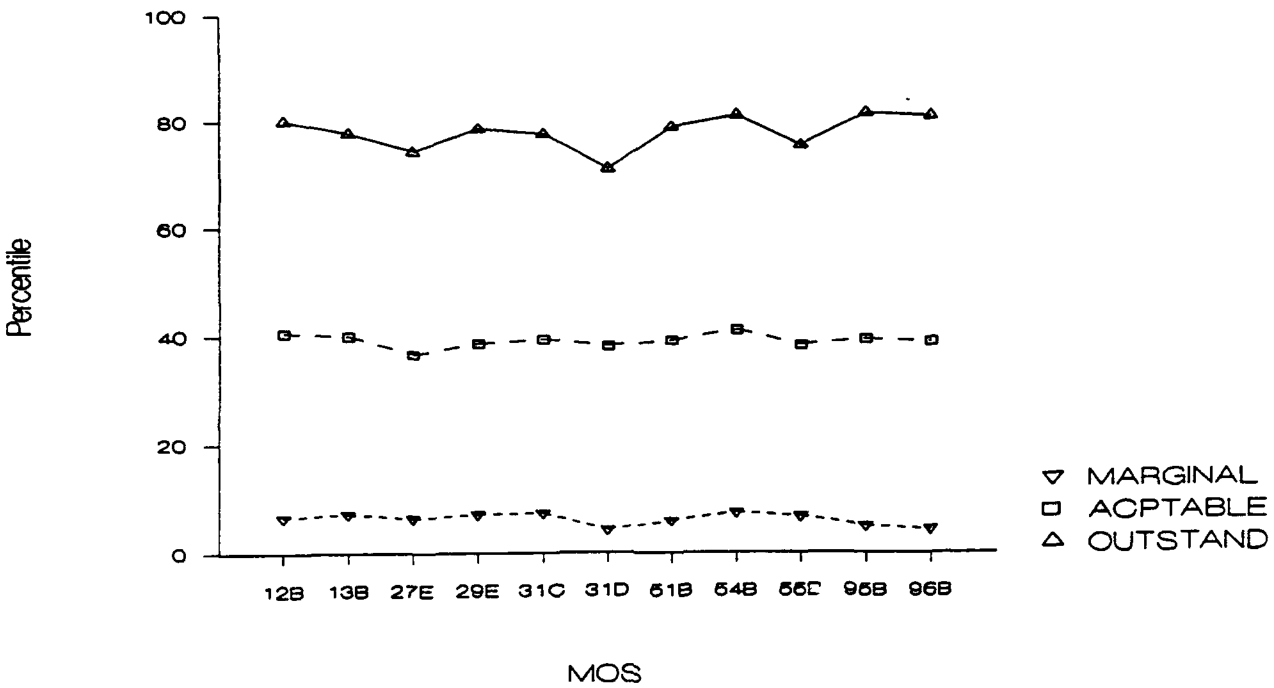

Figure 5.3. Behavioral Incident percentile cutoffs for each MOS.

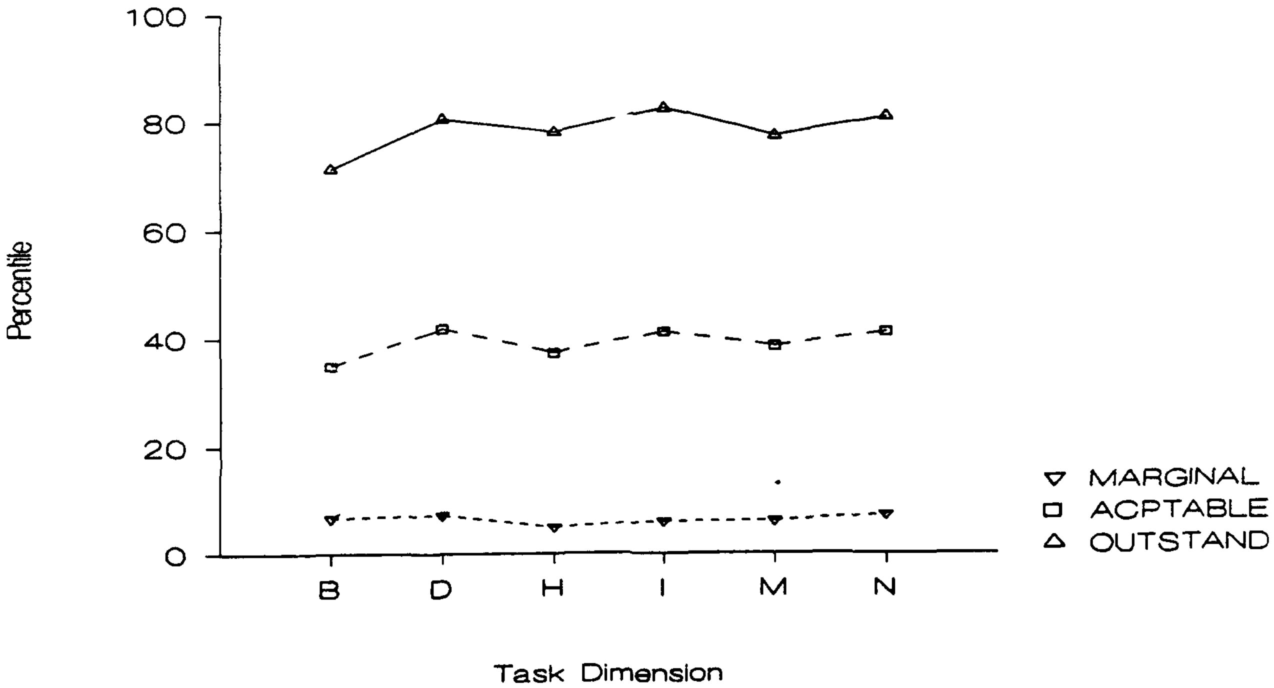

Figure 5.4. Behavioral Incident percentile cutoffs for each Task Dimension. (See Table 5.1 for Task Dimension Names.)

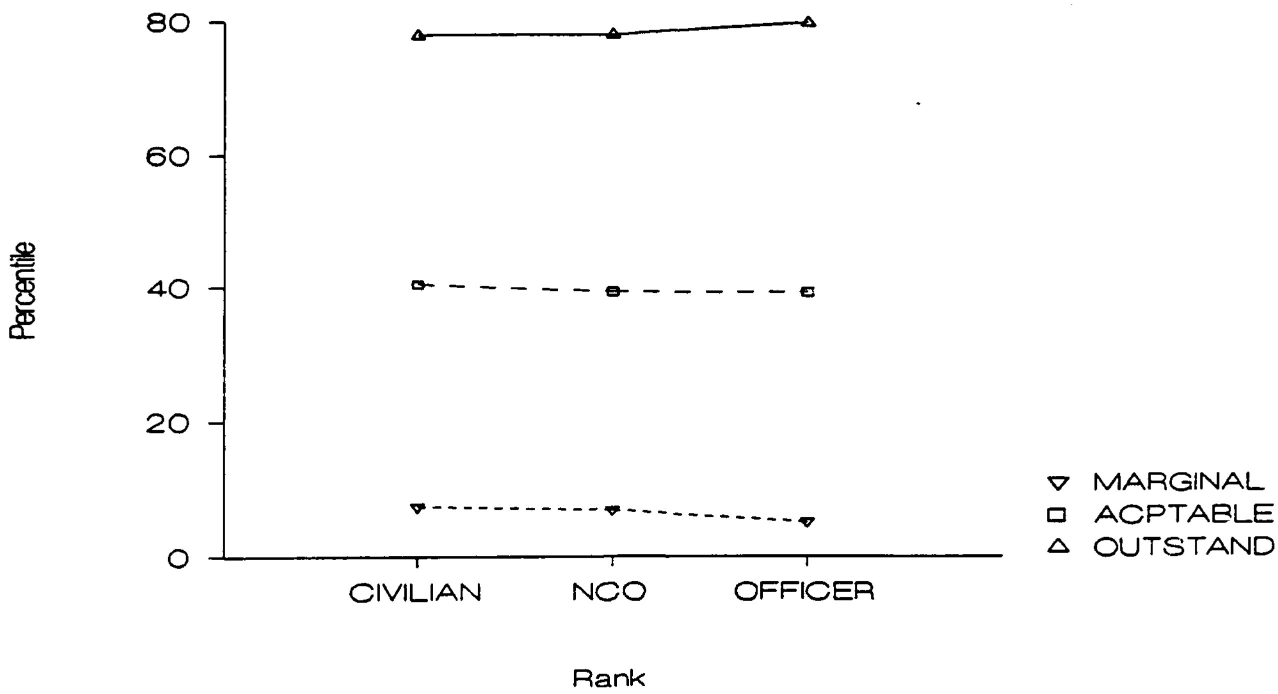

Figure 5.5. Behavioral Incident percentile cutoffs for NCOs and Officers.

communicated the character of each dimension. Then, three exemplar tasks, labelled "sample tasks", were selected for the questionnaire. Tasks were selected to be representative of the Project A performance distributions for the dimension as a whole. The instrument presented the three sample tasks and a single performance distribution that represented the performance, based on Project A data concurrent validation data, across the three sample tasks. For each level of test score, expressed as percent of task steps performed correctly (percent GO scores) and presented in 5-point increments, the form indicated the percent of soldiers performing at or below that score. Thus, each dimension cutoff could be expressed in terms of percent GO test scores or percentile scores. The percentile cutoff metric is equivalent to Behavioral Incident scoring.

Each dimension form was administered separately, with raters working as a group for part of the session. The raters' first task was to evaluate the exemplar tasks and determine their relevance to the MOS being rated. For tasks that were not relevant, raters were asked to think of a task, termed "substitute task", in their MOS that matched the characteristics and difficulty of the sample task. Then as a group, the raters agreed on three tasks, which might be any combination of given tasks and substitute tasks, to consider as representative of the dimension. Raters then were to consider the test scores and

performance distributions and set cutoffs between Unacceptable, Marginal, Acceptable, and Outstanding performance. Instrument instructions and workshop leaders explained that the performance distributions were obtained from actual test data, and they explained the circumstances under which that data was collected. It was emphasized that, unlike most Army performance testing situations, soldiers were given no advance warning and therefore had no opportunity to prepare for the tests.

The Phase III Task-Based Form was originally designed for raters to write on three separate lines the three percent GO scores that represented their chosen cut points. This format was revised after the workshops at the second data collection site. In the revised design, raters drew lines on the form, graphically indicating their chosen dividing lines. A Task-Based Standard Setting Form is presented in Appendix A, Attachment 3. A complete set of forms may be found in Volume II.

Task dimensions were matched to MOS as presented in Table 5.1 of the chapter introduction. In addition, raters in each MOS rerated two dimensions after a feedback discussion session was conducted. As part of the group discussion session, SMEs assisted the workshop leader in tabulating the cutoff points set during the initial rating session. The discussion focused on the variations in standards for each performance level with the workshop leader soliciting reasons for strict and lenient standards. Dimensions were discussed and rerated separately.

Qualitative Feedback

As indicated above, the Task-Based Standard Setting Form had to be revised after the workshops at the first two data collection sites. For several reasons, raters were confused by the questionnaire response format. They were asked to indicate on three separate blanks three unique numbers that represented the minimum percent GO scores for Marginal, Acceptable, and Outstanding performance. Rater errors included writing in percentile scores, writing in percent GO scores below the cutoff (i.e., the top of the next lower level), and using the same number for more than one cutoff. At some point during the workshops at the second data collection site, one of the workshop leaders determined that it would be more efficient to have raters draw three lines on their forms to divide the four performance groups. Test scores and performance distribution information was presented in matching columns so that a line drawn across the page showed each division in terms of test score and distribution and there was no confusion about the meaning of the placement of the line. In addition, the performance distribution data on the forms used at the first two sites was incorrect. Because of the incorrect data and the confusion over the responses, the Task-Based Standard Setting Form data from the first two data collection sites were not included in the analyses reported below.

Based on comments from the feedback discussion sessions, a number of observations were made. These concern the various standard setting strategies used by the raters, the reference points used by the raters, and suggested improvements in questionnaire format and administration.

The strategies used by SMEs to establish performance standards using the Task-Based exercise fall into five categories. These categories are briefly described below.

1. Criticality. A criticality strategy was used to set strict standards on life threatening (i.e., Individual Combat) and MOS-specific dimensions. For Individual Combat, SMEs felt that standards should be strict because not only is the individual soldier's life at stake but also are the lives of several other soldiers. For dimensions that are central to the MOS, SMEs wanted to establish strict standards because theoretically the soldier's specialized training qualifies him or her as an expert in that area.

2. Difficulty. If a dimension was perceived as being particularly difficult, SMEs were willing to set lenient standards. Conversely, SMEs tended to set strict standards for "easy" dimensions.

3. Traditional Standards. Many SMEs used traditional notions of 70, 80, and 90% correct to set minimum standards for Marginal, Acceptable, and Outstanding, respectively. The traditional standards strategy seemed to be used more frequently to set the Marginal cutoff of 60 or 70% correct than for higher levels of job performance. Many participants stated that they felt comfortable with a 60 or 70% cutoff because those are so prevalently used in high school as well as in the Army.

4. Frequency of Performance. SMEs tended to set stricter standards for task dimensions that were performed frequently compared to those performed infrequently. Even if a task was perceived as critical or difficult, SMEs were willing to be somewhat lenient if it was performed infrequently. However, leniency tended to evidence itself at the Acceptable and Outstanding cutoffs rather than at the Marginal level. For example, throwing grenades or loading, clearing, or reducing stoppage in an M16 rifle, for some MOS, are performed infrequently outside of basic training. Because these are critical tasks, SMEs tended to set a higher Marginal cutoff than for less critical tasks. However, SMEs were often lenient in their Acceptable and Outstanding standards for these tasks because they are rarely performed.

5. Normal Distribution. A few SMEs wanted to set standards so that 20% of the examinees would fall in the Outstanding category, 20% in the Unacceptable category, and the remaining 60% would be divided between the Acceptable and Marginal categories. Because the Project A hands-on test scores are not normally

distributed and these particular percentile values did not fall exactly on any of the 5-point increment test score options that were presented, this strategy could not be fully implemented, only approximated. A normal distribution strategy was expressed by only a few SMEs, all at TRADOC installations.

In addition to the strategies articulated by SMEs, workshop leaders observed other strategies that are pertinent to the standard setting process. One such observation concerns what is referred to in the standard setting literature as "absolute" versus "relative" standards. Should standards be "etched in stone", or should they be adjusted so that a specified percentage of examinees pass and/or fail? These theoretical differences are often labeled norm-referenced (i.e., "relative" standards) and criterion-referenced (i.e., "absolute" standards). Theoretically, these differences seem to be incompatible. In practice, however, standard setting decisions reflect a combination of the two philosophies (Shephard, 1980). The merging of these theoretical differences presented itself in discussions with workshop participants.

A norm-referenced paradigm was most likely to evidence itself when standards were set on the Individual Combat dimension. In that case, SMEs tended to set a minimum cutoff (i.e., Marginal) at the point at which 50% or more of the examinees passed. Their rationale was that in combat they wanted at least half of the troops to survive. By setting a minimum performance score at that point, they felt that they increased their chances of attaining that goal.

The criterion-referenced paradigm manifested itself when SMEs either consciously or unconsciously decided not to use the normative data to establish their standards. Some SMEs ignored the normative data because they could not figure out how to use it. Their confusion seemed to be due to the individuals' inability to interpret the data rather than to a lack of clarity in the instructions given that other SMEs in the same session did use the data. Some SMEs made a conscious decision to ignore the normative data because they wanted soldiers to perform at a given level regardless of any implications about the number of soldiers whose performance would fall into a particular category. Some of the latter group of SMEs realized that by setting high performance standards they could influence the quality of soldiers selected for their MOS.

Another issue raised in the Task-Based exercise concerns exactly what SMEs concentrated on when setting their individual standards. In other words, did SMEs focus on (a) a single sample task, (b) the dimension as defined by the three sample tasks, or (c) the dimension as defined by all tasks (i.e., the sample tasks plus others)? According to the instructions, raters were to set standards on dimensions of job performance by focusing on three sample tasks selected to represent that dimension. During the discussion, some SMEs commented on only one sample task for a

particular dimension. This behavior would lead one to believe that rather than cognitively combining standards for the three sample tasks to yield a dimension standard those SMEs actually set standards on only one task. At some workshops, SMEs were asked whether they focused on the dimension or the sample tasks. The responses were spread about evenly across the two choices. In hindsight, however, the term "dimension" was not clearly defined. In other words, "dimension" could mean the three sample tasks only, or it could mean the three sample tasks plus all other tasks within the dimension. Given the ambiguous nature of the question, reliable inferences cannot be drawn regarding the SMEs' definitions of dimension. Because no manipulation check was made to ensure that SMEs centered on nothing more or less than the three sample tasks, one cannot be sure of the cognitive processes used to set standards on a "dimension."

As with the Behavioral Incident exercise, SMEs had ideas on how to improve the Task-Based exercise. Several experts wanted finer gradations of the percent GO scale, particularly at the top. For many dimensions, the Outstanding cutoffs were set at 95% correct, which resulted in classifying anywhere from 13% for Dimension D (Vehicle and Equipment Operations) to 36% for Dimension N (Crew-served Weapons) of the examinees as Outstanding. Many SMEs felt that grouping as many as one-fourth of the soldiers into an Outstanding category reduced the prestige of an Outstanding rating and made the standards too lenient.

Some SMEs expressed a desire for more information on the way the hands-on tests were scored. They did not want to see an actual test; they merely wanted to know more about the scoring system. They are familiar with performance test scoring whereby each step is scored dichotomously (GO vs. NO-GO) yet the final score is a dichotomous GO or NO-GO depending on whether all steps were performed correctly and in the proper sequence. In many Army performance tests, a NO-GO score on a single step results in a failing score (i.e., a final NO-GO score) regardless of the number of steps performed correctly. Many SMEs assumed this type of scoring system for the hands-on tests. Some assumed their own scoring system in which a soldier received an overall GO even if he or she performed some steps incorrectly or out of sequence but the final product was acceptable. SMEs who admitted assuming the latter scoring system (i.e., a more lenient system) set stricter standards than those who admitted assuming the relatively strict Army scoring system. It may seem obvious to researchers that the percent GO scores represent the percentage of steps performed correctly as opposed to a single, final dichotomous score. However, this apparently was not obvious to the standard setting judges. A related version of SME uncertainty with the scoring system concerned the amount of detail that was scored. SMEs who expressed the assumption that the test probably included scoring of trivial steps tended to argue for lower cutoffs. If the Task-Based exercise is operationally used as a standard setting procedure, details regarding the scoring system for the hands-on tests may need to be included in the instructions.

SMEs felt that the emphasis on the fact that examinees had no time to prepare for the hands-on tests should be maintained or even strengthened. In the Army, test dates are scheduled well in advance thereby allowing ample opportunity for the soldier to study and prepare for that test. The hands-on tests were unique in that soldiers received no forewarning as to the nature of the tests, the tasks to be tested, etc. Because our unscheduled hands-on tests deviated from standard Army practice, SMEs felt that this point should be well-articulated.

Some experts wanted more information about the normative population, specifically they wanted to know how the distribution of scores would look for only their MOS. For MOS-specific dimensions, several experts wanted to set strict standards if the data were obtained from soldiers in an MOS that does not normally perform tasks in that dimension.

Data Editing

As noted above, all of the Task-Based Standard Setting Form responses from the first two data collection sites were eliminated from the analyses. In addition, questionnaire responses were screened to insure that three cutoff points were indicated. If three lines were not drawn, we could not unequivocally match lines to divisions between performance levels. Table 5.13 indicates the number of rating sheets dropped from our analyses.

Table 5.13

Number of Task-Based Standard Setting Forms Dropped During Edits

Dimension	Number of Forms Dropped: Initial Rating	Rerating
B. Electrical & Electronic Main't	2	4
D. Vehicle & Equipt. Operations	12	10
H. Clerical	18	2
I. Communications	4	2
M. Individual Combat	13	22
N. Crew-Served Weapons	5	-

Descriptive Statistics

Tables 5.14 and 5.15 present means and standard deviations across raters for the standards set by each MOS, by each dimension, for both initial rating (called Trial 1 ratings) and rerating (called Trial 2 ratings). Table 5.14 presents standards in terms of percent GO test scores. Table 5.15 presents the standards in terms of percentile scores. As with the Behavioral Incident data, the standard deviations in these tables are one index of rater agreement.

Because the percentile metric is the primary index for linking performance standards to selection standards, the remaining analyses focus on this metric. Table 5.16 presents a summary across MOS of the within-MOS percentile means (i.e., the standards) and standard deviations for each dimension. For example, four MOS rated Dimension B (Electrical and Electronic Maintenance). The mean cutoff for Marginal performance indicates that 18.85% of all soldiers may be expected to fall below Marginal. The average within-MOS standard deviations for that cutoff was 14.22. Only two MOS rerated Dimension B. For the Dimension B rerate, the average Marginal cutoff was 18.62, and the average within-MOS standard deviation was 10.19. At the bottom of the table, the means for these within-MOS statistics are presented averaged across all MOS-by-dimension combinations. Initial rating means are presented for the full set of data and for the MOS-by-dimension cases that match the rerate data set.

Examining these data suggests that neither standard levels (i.e., within-MOS means) nor rater agreement (i.e., within-MOS standard deviations) change greatly from the initial rating to the rerating. Table 5.17 presents tests of the differences between initial rating and rerating standards and rater agreement for Marginal, Acceptable, and Outstanding. Tests were conducted using a repeated measures ANOVA with the 22 MOS-by-dimension combinations as cases and the within-MOS statistics as the repeated "trials." Results indicate that the discussion and rerating process appears to influence the cutoffs for all three levels of standards but it only affects rater agreement for the Acceptable cutoff level. Closer inspection of the data at the bottom of Table 5.16 indicates that the rerating process leads to standards that are about two points higher at each cutoff. As with the Behavioral Incident Questionnaire, standard deviations, when converted to standard errors of the means, suggest reliable ratings. Assuming 60 raters, standard errors of the mean are estimated at 1.4 to 1.9 for the across dimensions data reported at the bottom of Table 5.16.

Table 5.14

Task-Based Standard Setting Form: Minimum Cutoff Percent Go Scores by MOS, Dimension, and Trial

		Trial 1							Trial 2						
			Marginal		Acceptable		Outstanding			Marginal		Acceptable		Outstanding	
MOS	Dimension	Sample	X	SD	X	SD	X	SD	Sample	X	SD	X	SD	X	SD
12B	M	N=77	67.92	10.74	81.56	7.31	95.65	3.18	N=76	71.18	10.29	83.88	7.51	96.78	3.13
	D	N=76	62.83	10.11	77.30	7.09	93.62	4.29	N=77	64.74	7.52	78.05	6.39	93.96	3.83
13B	M	N=71	69.93	11.85	81.48	8.12	94.86	4.14	N=63	71.35	10.63	82.70	7.12	95.00	4.21
	D	N=69	67.46	12.62	80.29	7.99	93.33	4.43	N=65	70.54	10.94	82.54	7.76	94.38	3.90
	N	N=67	73.66	12.69	84.70	9.29	95.52	6.28	-	-	-	-	-	-	-
27E	M	N=23	64.78	8.46	78.70	7.11	94.57	3.34	N=22	67.05	8.12	80.68	5.83	94.77	3.26
	B	N=23	64.78	11.63	78.91	10.55	93.91	6.21	N=20	69.25	9.07	82.25	8.03	95.25	4.72
	H	N=22	62.05	13.60	76.14	8.85	92.73	4.00	-	-	-	-	-	-	-
29E	M	N=29	67.76	10.32	80.69	8.42	95.00	3.78	N=27	68.89	9.02	82.22	5.94	95.19	3.53
	B	N=28	67.50	8.44	80.89	6.81	95.00	4.30	N=25	69.00	7.77	82.00	6.29	95.60	4.41
	I	N=29	62.93	10.98	78.28	6.02	93.97	5.24	-	-	-	-	-	-	-
31C	M	N=76	68.09	11.07	81.58	7.62	95.92	3.44	N=72	69.17	10.04	82.15	6.60	96.04	3.45
	I	N=76	66.84	10.92	80.99	8.08	95.53	3.12	N=74	67.03	9.10	81.28	6.31	95.34	3.02
	B	N=75	72.40	11.78	84.47	7.60	96.80	3.56	-	-	-	-	-	-	-
31D	M	N=17	58.24	12.37	74.71	8.00	92.94	2.54	N=15	62.00	10.49	78.33	6.73	93.33	2.44
	I	N=16	64.69	12.04	79.06	7.79	93.44	3.97	N=14	67.14	10.32	80.00	7.34	93.57	3.63
	B	N=16	64.69	15.97	79.06	11.58	92.50	6.83	-	-	-	-	-	-	-
51B	M	N=76	64.87	10.16	79.61	8.03	94.67	4.03	N=70	66.07	8.63	80.64	6.48	95.57	3.13
	D	N=75	65.57	7.28	79.33	6.38	94.67	3.32	N=72	65.29	8.07	79.93	6.34	95.21	2.88
54B	M	N=18	64.72	11.18	79.44	7.84	95.83	1.92	N=18	70.56	10.13	83.61	7.82	96.39	2.30
	D	N=17	62.06	10.76	77.65	6.87	95.00	2.50	N=18	64.72	7.95	80.00	6.18	95.00	2.43
55B	M	N=44	63.98	11.44	78.98	9.06	94.77	3.88	N=42	70.95	11.00	83.69	7.89	96.19	3.79
	H	N=44	61.59	10.27	77.73	8.31	93.75	4.59	N=43	65.58	9.65	80.00	7.24	94.30	4.02
	D	N=45	63.00	12.08	76.78	8.13	92.89	5.28	-	-	-	-	-	-	-

(table continues)

Table 5.14 (continued)

		Trial 1							Trial 2						
			Marginal		Acceptable		Outstanding			Marginal		Acceptable		Outstanding	
MOS	Dimension	Sample	X	SD	X	SD	X	SD	Sample	X	SD	X	SD	X	SD
95B	M	N=47	67.87	9.82	81.38	6.97	95.11	3.21	N=48	72.60	9.05	84.17	6.04	96.15	3.14
	H	N=36	66.11	10.90	80.83	7.12	94.44	4.27	N=36	65.14	9.75	80.69	6.56	94.58	4.03
	I	N=48	68.75	11.60	82.08	6.75	95.10	3.01	-	-	-	-	-	-	-
96B	M	N=42	62.62	10.37	79.76	7.80	95.60	2.96	N=41	62.80	10.49	80.37	6.93	95.49	3.50
	I	N=44	58.52	14.17	78.52	7.12	94.43	3.45	N=43	57.21	14.65	78.26	8.16	94.65	4.28
	H	N=43	56.05	13.87	75.70	7.37	93.02	4.38	-	-	-	-	-	-	-

Note. Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

Table 5.15

Task-Based Standard Setting Form: Minimum Cutoff Percentile Scores at each Level by MOS, Dimension, and Trial

		Trial 1							Trial 2						
			Marginal		Acceptable		Outstanding			Marginal		Acceptable		Outstanding	
MOS	Dimension	Sample	X	SD	X	SD	X	SD	Sample	X	SD	X	SD	X	SD
12B	M	N=77	24.82	14.35	45.47	15.80	81.82	12.05	N=76	28.75	13.97	50.55	16.05	86.33	12.42
	D	N=76	30.22	14.27	55.32	13.74	85.18	8.44	N=77	32.22	12.23	56.75	12.55	85.81	7.86
13B	M	N=71	27.77	15.23	45.58	16.31	79.56	14.27	N=63	29.08	15.22	47.68	15.21	80.17	14.73
	D	N=69	38.86	19.18	60.71	15.27	84.55	8.34	N=65	43.34	18.61	65.03	14.42	86.69	8.05
	N	N=67	29.87	11.20	43.34	13.92	75.55	21.42	-	-	-	-	-	-	-
27E	M	N=23	20.04	10.07	39.48	13.61	77.91	12.22	N=22	22.23	9.88	42.86	11.71	78.59	12.06
	B	N=23	15.96	12.43	34.39	18.45	70.87	21.86	N=20	19.60	10.71	40.15	13.82	73.50	19.19
	H	N=22	32.82	17.54	53.41	16.47	83.18	6.99	-	-	-	-	-	-	-
29E	M	N=29	24.52	14.14	43.97	18.00	79.83	13.49	N=27	25.00	12.09	46.26	12.92	80.26	12.58
	B	N=28	16.36	10.64	37.57	12.60	71.71	17.90	N=25	17.64	9.66	39.60	11.15	74.72	18.86
	I	N=29	38.14	10.06	52.21	7.78	81.55	9.79	-	-	-	-	-	-	-
31C	M	N=76	25.21	14.78	45.66	16.24	83.16	13.30	N=72	25.97	13.92	46.38	14.34	83.61	13.17
	I	N=76	41.97	10.57	57.38	11.93	85.29	8.74	N=74	41.78	9.05	57.05	10.71	84.85	8.38
	B	N=75	25.13	17.32	44.28	14.88	81.37	18.92	-	-	-	-	-	-	-
31D	M	N=17	15.53	10.59	32.88	13.71	71.82	7.61	N=15	17.93	10.44	38.60	13.37	73.00	7.32
	I	N=16	40.44	12.48	54.69	11.32	80.00	8.19	N=14	42.71	11.14	55.93	11.36	80.50	7.66
	B	N=16	17.94	16.47	35.88	18.28	66.38	22.63	-	-	-	-	-	-	-
51B	M	N=76	20.97	11.54	41.67	14.76	78.59	13.01	N=70	21.51	9.35	43.16	12.77	81.47	11.82
	D	N=75	33.79	12.07	59.23	12.42	87.07	7.03	N=72	33.27	13.43	60.57	12.06	88.09	6.37
54B	M	N=18	20.67	10.90	41.44	14.13	81.67	8.44	N=18	27.72	14.82	50.11	17.35	84.11	10.14
	D	N=17	29.47	12.81	55.76	13.56	87.47	5.57	N=18	32.39	12.40	60.39	12.00	87.44	5.40
55B	M	N=44	20.52	12.90	41.16	16.93	79.16	13.99	N=42	29.00	16.67	50.36	17.51	84.57	14.57
	H	N=44	30.68	13.70	56.11	15.45	85.00	8.83	N=43	36.02	13.77	60.35	13.64	86.16	8.01
	D	N=45	31.31	17.64	54.24	15.56	83.93	10.23	-	-	-	-	-	-	-

(table continues)

Table 5.15 (continued)

			Trial 1							Trial 2					
			Marginal		Acceptable		Outstanding			Marginal		Acceptable		Outstanding	
MOS	Dimen-sion	Sample	X	SD	X	SD	X	SD	Sample	X	SD	X	SD	X	SD
95B	M	N=47	24.09	12.81	44.81	14.58	79.81	12.08	N=48	30.19	13.89	50.50	13.42	83.77	12.44
	H	N=36	37.11	16.34	61.86	13.60	86.67	8.62	N=36	35.06	15.57	61.64	12.45	86.53	8.18
	I	N=48	44.19	12.14	59.10	12.03	84.21	8.09	-	-	-	-	-	-	-
96B	M	N=42	18.50	10.34	41.95	15.88	81.45	11.54	N=41	18.85	10.39	42.78	14.80	81.44	12.88
	I	N=44	35.75	11.89	53.82	10.91	83.20	8.58	N=43	34.37	13.17	53.95	12.06	84.12	10.70
	H	N=43	25.51	13.69	52.33	13.74	83.37	7.85	-	-	-	-	-	-	-

Note. Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

Table 5.16

Task-Based Standard Setting Form: Means and Standard Deviations Across MOS of within MOS Statistics by Dimension and Trial

			Within MOS Statistics												
			Trial 1							Trial 2					
	Across		Marginal		Acceptable		Outstanding			Marginal		Acceptable		Outstanding	
Dimension	MOS Stats	Sample	X	SD	X	SD	X	SD	Sample	X	SD	X	SD	X	SD
B	X:	N=4	18.85	14.22	38.03	16.05	72.58	20.33	N=2	18.62	10.19	39.88	12.49	74.11	19.03
	SD:		4.27	3.20	4.36	2.83	6.31	2.27		1.39	0.74	0.39	1.89	0.86	0.23
D	X:	N=5	32.73	15.19	57.05	14.11	85.64	7.92	N=4	35.31	14.17	60.69	12.76	87.01	6.92
	SD:		3.80	3.09	2.77	1.30	1.56	1.74		5.38	3.01	3.39	1.14	0.98	1.26
H	X:	N=4	31.53	15.32	55.93	14.82	84.56	8.07	N=2	35.54	14.67	61.00	13.05	86.35	8.10
	SD:		4.82	1.94	4.26	1.39	1.63	0.84		0.68	1.27	0.91	0.84	0.26	0.12
I	X:	N=5	40.10	11.43	55.44	10.79	82.85	8.68	N=3	39.62	11.12	55.64	11.38	83.16	8.91
	SD:		3.28	1.05	2.77	1.75	2.11	0.68		4.57	2.06	1.57	0.68	2.33	1.59
M	X:	N=11	22.06	12.51	42.19	15.45	79.53	12.00	N=11	25.11	12.79	46.29	14.50	81.57	12.19
	SD:		3.54	1.92	3.75	1.41	3.00	2.15		4.35	2.47	4.02	1.90	3.65	2.05
N	X:	N=1	29.87	11.20	43.34	13.92	75.55	21.42	-	-	-	-	-	-	-
	SD:		-	-	-	-	-	-	-	-	-	-	-	-	-
All Dimensions:															
	X:	N=30	27.94	13.34	48.19	14.40	80.71	11.67	N=22	29.30	12.74	50.94	13.44	82.53	11.04
	X[a]:	N=22	26.97	12.91	47.77	14.51	80.99	11.10	-	-	-	-	-	-	-

Note. Each case is represented by an MOS-by-Dimension; means and standard deviations for ratings within each MOS are the variables.
Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

[a]Mean is based on the same 22 cases found in Trial 2.

Table 5.17

Planned Comparison for Trial Effects on MOS Cut Score Means and Variances Using Repeated Measures ANOVA

Source	SS	df	MS	F	p
Trial Effects on Cut Score Means:					
Marginal Cut	119.996	1	119.996	16.223	0.001
Error	155.333	21	7.397		
Acceptable Cut	221.076	1	221.076	29.939	0.000
Error	155.06	21	7.384		
Outstanding Cut	52.360	1	52.360	20.197	0.000
Error	54.442	21	2.592		
Trial Effects on Cut Score Standard Deviations: (within-MOS variation)					
Marginal Cut	0.606	1	0.606	0.224	0.[illegible]41
Error	56.849	21	2.707		
Acceptable Cut	25.166	1	25.166	8.513	0.008
Error	62.077	21	2.956		
Outstanding Cut	0.078	1	0.078	0.073	0.790
Error	22.499	21	1.071		

Note. Each case is represented by an MOS-by-Dimension; means and standard deviations for ratings within each MOS are the variables.

Task-Based Standard Setting Form Reliability Estimate

Similar to the other Phase III instruments, reliability estimates were computed for each rater group (e.g., TRADOC NCOs, TRADOC Officers), for rater groups combined within command (e.g., TRADOC total), for rater groups combined across commands (e.g., combined NCOs), and for all raters across rank and command. The reliability estimation procedure was identical to that used for the Army Task Questionnaire and Behavioral Incident Standard Setting Questionnaire. Separate estimates were computed for each dimension rated within each MOS. Table 5.18 presents single-rater and overall reliability estimates calculated using percentile scores. Table 5.19 presents means for the single-rater reliability estimates, first by dimension across the relevant MOS, and then across all MOS-by-dimension combinations.

Several observations may be made about these reliability estimates, assisted again with a series of ANOVA. First, using only the reliabilities for combined ranks and commands (i.e., the next to the last column in Table 5.18), differences in reliability among the task dimensions and between initial and rerating sessions were compared. Dimension differences in reliability estimates were significant ($\underline{F}_{4,37} = 4.49$, $\underline{p} < .01$) but repetition differences were not ($\underline{F}_{1,40} = 1.32$, ns). Dimensions differ in their reliability estimates from .70 for Electrical and Electronic Maintenance initial ratings to .81 for Individual Combat initial ratings with all raters combined. Second, using the reliabilities for combined commands, differences by rank were not significant ($\underline{F}_{2,110} = 0.10$, ns); and third, using the reliabilities for combined ranks, differences by command were not significant ($\underline{F}_{1,88} = 0.46$, ns).

Fourth, the reliability estimates of the combined rater groups show no decrement from the reliability estimates for the separate groups. For example, the average reliability for all TRADOC raters is .81, the average reliability for all FORSCOM raters is .80, and the reliability across all raters is .80. Thus, there is no suggestion that the rater groups are providing significantly different cutoffs.

Last and most obvious, these single-rater reliability estimates are quite high. Of course, the rating format of drawing lines for the cutoffs guarantees at least ordinal agreement among the raters. Still, using .80 as the representative single-rater estimate, with 60 raters the overall reliability would be .996. Using the rerating cutoff averaged across all MOS-by-dimension combinations, the standard deviation across cutoff may be estimated as 21.9. Combining those estimates yields an overall projection for standard error of measurement of 1.4. This is congruent with the error estimate based on within-MOS standard deviations for the cutoff levels (i.e., 1.4 to 1.9).

Table 5.18

Task-Based Standard Setting Form: Reliability Estimates by Dimension

		Single-Rater Reliability Estimates												
		TRADOC				FORSCOM				COMBINED				Total r_{11} With All Raters
MOS	Dimension	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	
12B	M1	.91	.82	-	.85	.75	.79	-	.77	.79	.80	-	.79	.99
	N of cases	11	12	2	25	29	23	0	52	40	35	2	77	
	D1	.79	.93	-	.87	.80	.77	-	.79	.80	.83	-	.81	.99
	N of cases	10	12	2	24	29	23	0	52	39	35	2	76	
	M2	.88	.78	-	.83	.75	.84	-	.78	.78	.80	-	.79	.99
	N of cases	12	12	1	25	29	22	0	51	41	34	1	76	
	D2	.77	.93	-	.84	.84	.84	-	.84	.82	.87	-	.84	.99
	N of cases	12	12	2	26	29	22	0	51	41	34	2	77	
13B	M1	.85	.79	.58	.77	.84	.66	-	.74	.83	.68	.58	.73	.99
	N of cases	7	6	6	19	28	24	0	52	35	30	6	71	
	D1	.81	.80	.47	.71	.69	.68	-	.68	.69	.71	.47	.68	.99
	N of cases	8	6	6	20	26	23	0	49	34	29	6	69	
	N1	.66	.69	.72	.70	.62	.68	-	.64	.63	.68	.72	.66	.99
	N of cases	8	5	6	19	25	23	0	48	33	28	6	67	
	M2	.85	.71	.61	.73	.79	.69	-	.74	.80	.70	.61	.73	.99
	N of cases	5	5	6	16	27	20	0	47	32	25	6	63	
	D2	.83	.83	.59	.78	.59	.74	-	.65	.63	.76	.59	.67	.99
	N of cases	8	5	5	18	26	21	0	47	34	26	5	65	
27E	M1	.85	-	-	.87	.80	-	-	.81	.83	-	-	.85	.99
	N of cases	13	0	3	16	6	1	0	7	19	1	3	23	
	B1	.63	-	-	.67	.72	-	-	.72	.67	-	-	.69	.98
	N of cases	13	0	3	16	6	1	0	7	19	1	3	23	
	H1	.68	-	-	.74	.67	-	-	.71	.69	-	-	.73	.98
	N of cases	12	0	3	15	6	1	0	7	18	1	3	22	
	M2	.87	-	-	.89	.77	-	-	.77	.84	-	-	.85	.99
	N of cases	13	0	3	16	6	0	0	6	19	0	3	22	
	B2	.73	-	-	.74	.81	-	-	.81	.74	-	-	.75	.98
	N of cases	12	0	3	15	5	0	0	5	17	0	3	20	

(table continues)

Table 5.18 (continued)

		Single-Rater Reliability Estimates												
		TRADOC				FORSCOM				COMBINED				Total r_{11} With All Raters
MOS	Dimension	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	
29E	M1	.76	-	-	.73	.73	.99	-	.77	.74	.87	-	.75	.99
	N of cases	12	2	3	17	8	4	0	12	20	6	3	29	
	B1	.75	-	-	.75	.79	.79	-	.79	.77	.84	-	.78	.99
	N of cases	12	2	3	17	7	4	0	11	19	6	3	28	
	I1	.79	-	-	.77	.93	.98	-	.94	.82	.94	-	.82	.99
	N of cases	12	2	3	17	8	4	0	12	20	6	3	29	
	M2	.83	-	-	.79	.83	-	-	.84	.83	.85	-	.81	.99
	N of cases	12	2	3	17	8	2	0	10	20	4	3	27	
	B2	.76	-	-	.76	.84	-	-	.84	.78	.86	-	.78	.99
	N of cases	12	2	3	17	6	2	0	8	18	4	3	25	
31C	M1	.74	.80	-	.75	.84	.77	-	.80	.79	.79	-	.78	.99
	N of cases	15	12	1	28	27	21	0	48	42	33	1	76	
	I1	.83	.83	-	.82	.84	.77	-	.81	.81	.79	-	.80	.99
	N of cases	15	12	1	28	27	21	0	48	42	33	1	76	
	B1	.72	.81	-	.76	.69	.75	-	.71	.68	.77	-	.72	.99
	N of cases	15	12	0	27	27	21	0	48	42	33	0	75	
	M2	.73	.79	-	.76	.87	.82	-	.83	.80	.82	-	.80	.99
	N of cases	14	11	0	25	26	21	0	47	40	32	0	72	
	I2	.79	.80	-	.80	.91	.89	-	.90	.82	.84	-	.83	.99
	N of cases	15	12	0	27	27	20	0	47	42	32	0	74	
31D	M1	.89	-	-	.86	-	-	-	-	.89	-	-	.86	.99
	N of cases	15	1	1	17	0	0	0	0	15	1	1	17	
	I1	.75	-	-	.76	-	-	-	-	.75	-	-	.76	.98
	N of cases	14	1	1	16	0	0	0	0	14	1	1	16	
	B1	.63	-	-	.61	-	-	-	-	.63	-	-	.61	.96
	N of cases	14	1	1	16	0	0	0	0	14	1	1	16	
	M2	.89	-	-	.86	-	-	-	-	.89	-	-	.86	.99
	N of cases	14	0	1	15	0	0	0	0	14	0	1	15	
	I2	.77	-	-	.77	-	-	-	-	.77	-	-	.77	.98
	N of cases	13	0	1	14	0	0	0	0	13	0	1	14	

(table continues)

Table 5.18 (continued)

MOS	Dimension	Single-Rater Reliability Estimates: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{11} With All Raters
51B	M1	.86	.79	.77	.78	.85	.86	-	.85	.86	.82	.77	.82	.99
	N of cases	12	11	6	29	26	21	0	47	38	32	6	76	
	D1	.90	.87	.88	.88	.82	.82	-	.82	.85	.84	.88	.84	.99
	N of cases	12	11	6	29	25	21	0	46	37	32	6	75	
	M2	.91	.86	.91	.83	.87	.89	-	.88	.88	.86	.91	.86	.99
	N of cases	11	10	6	27	23	20	0	43	34	30	6	70	
	D2	.89	.85	.86	.86	.79	.88	-	.83	.82	.87	.86	.84	.99
	N of cases	12	10	5	27	23	20	0	43	35	30	5	70	
54B	M1	-	-	-	-	.89	.83	-	.86	.89	.83	-	.86	.99
	N of cases	0	0	0	0	12	6	0	18	12	6	0	18	
	D1	-	-	-	-	.85	.87	-	.85	.85	.87	-	.85	.99
	N of cases	0	0	0	0	11	6	0	17	11	6	0	17	
	M2	-	-	-	-	.79	.80	-	.78	.79	.80	-	.78	.98
	N of cases	0	0	0	0	12	6	0	18	12	6	0	18	
	D2	-	-	-	-	.84	.88	-	.85	.84	.88	-	.85	.99
	N of cases	0	0	0	0	12	6	0	18	12	6	0	18	
55B	M1	.85	.81	.88	.84	.76	.71	-	.74	.80	.76	.88	.79	.99
	N of cases	13	5	5	23	14	7	0	21	27	12	5	44	
	D1	.88	.76	.88	.86	.70	.78	-	.73	.79	.79	.88	.80	.99
	N of cases	12	5	6	23	14	7	0	21	26	12	6	44	
	H1	.82	.71	.84	.79	.69	.65	-	.69	.74	.69	.84	.74	.99
	N of cases	13	5	6	24	15	6	0	21	28	11	6	45	
	M2	.82	.71	.81	.76	.68	.73	-	.70	.72	.72	.81	.73	.99
	N of cases	11	4	5	20	15	7	0	22	26	11	5	42	
	D2	.79	-	.87	.82	.74	.81	-	.77	.77	.80	.87	.79	.99
	N of cases	13	3	6	22	14	7	0	21	27	10	6	43	

(table continues)

Table 5.18 (continued)

MOS	Dimension	Single-Rater Reliability Estimates: TRADOC NCO	TRADOC OFF	TRADOC CIV	TRADOC TOT	FORSCOM NCO	FORSCOM OFF	FORSCOM CIV	FORSCOM TOT	COMBINED NCO	COMBINED OFF	COMBINED CIV	COMBINED TOT	Total r_{ii} With All Raters
	N of cases	0	0	0	0	28	19	0	47	28	19	0	47	
	H1	-	-	-	-	.86	.73	-	.76	.86	.73	-	.76	.99
	N of cases	0	0	0	0	15	21	0	36	15	21	0	36	
	I1	-	-	-	-	.81	.69	-	.75	.81	.69	-	.75	.99
	N of cases	0	0	0	0	28	20	0	48	28	20	0	48	
	M2	-	-	-	-	.82	.76	-	.79	.82	.76	-	.79	.99
	N of cases	0	0	0	0	27	21	0	48	27	21	0	48	
	H2	-	-	-	-	.87	.76	-	.79	.87	.76	-	.79	.99
	N of cases	0	0	0	0	15	21	0	36	15	21	0	36	
96B	M1	.92	-	.92	.92	.78	.89	-	.80	.85	.89	.92	.84	.99
	N of cases	18	0	5	23	13	6	0	19	31	6	5	42	
	I1	.78	-	.92	.81	.86	.79	-	.83	.82	.79	.93	.81	.99
	N of cases	18	0	5	23	13	7	1	21	31	7	6	44	
	H1	.83	-	.97	.85	.86	.77	-	.81	.84	.77	.92	.83	.99
	N of cases	18	0	5	23	13	6	1	20	31	6	6	43	
	M2	.90	-	.93	.91	.81	.87	-	.81	.85	.87	.93	.84	.99
	N of cases	18	0	5	23	12	6	0	18	30	6	5	41	
	I2	.77	-	.92	.80	.85	.81	-	.78	.81	.81	.82	.79	.99
	N of cases	18	0	5	23	12	7	1	20	30	7	6	43	

Note. The number after the dimension signifies initial rating (1) or rerating (2).
Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

Table 5.19

Task-Based Standard Setting Form: Mean Reliabilities by Dimension

Dimension	TRADOC				FORSCOM				COMBINED			
	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT
B1	.68	.81	-	.70	.73	.77	-	.74	.69	.81	-	.70
N of cases[a]	4	1	0	4	3	2	0	3	4	2	0	4
B2	.74	-	-	.75	.82	-	-	.82	.76	.86	-	.77
N of cases	2	0	0	2	2	0	0	2	2	1	0	2
D1	.83	.83	.73	.81	.77	.76	-	.77	.79	.79	.73	.79
N of cases	4	4	3	4	5	5	0	5	5	5	3	5
D2	.83	.87	.73	.83	.76	.83	-	.79	.78	.85	.73	.80
N of cases	3	3	2	3	4	4	0	4	4	4	2	4
H1	.79	.76	.93	.81	.77	.76	-	.75	.79	.76	.90	.78
N of cases	3	1	2	3	4	3	0	1	5	3	2	4
H2	.79	-	.87	.82	.81	.79	-	.78	.82	.79	.87	.79
N of cases	1	0	1	1	2	2	0	2	2	2	1	2
I1	.79	.83	.92	.79	.86	.81	-	.83	.80	.81	.93	.79
N of cases	4	1	1	4	4	4	0	4	5	4	1	5
I2	.78	.80	.92	.79	.88	.85	-	.84	.80	.82	.82	.79
N of cases	3	1	1	3	2	2	0	2	3	2	1	3
M1	.85	.80	.79	.82	.80	.81	-	.79	.82	.81	.79	.81
N of cases	9	2	4	9	10	9	0	10	11	9	4	11
M2	.85	.77	.81	.82	.80	.80	-	.79	.82	.80	.82	.80
N of cases	4	5	4	9	10	8	0	10	11	9	4	11
N1	.66	.69	.72	.70	.62	.68	-	.64	.63	.68	.72	.66
N of cases	1	1	1	1	1	1	0	1	1	1	1	1

(table continues)

Table 5.19 (continued)

Dimension	TRADOC				FORSCOM				COMBINED			
	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT	NCO	OFF	CIV	TOT
1ST RATING[b]	.80	.81	.81	.79	.79	.80	-	.78	.79	.80	.81	.78
N of cases	24	12	10	24	26	23	0	26	29	23	10	29
RERATE[b]	.82	.81	.81	.81	.80	.81	-	.80	.80	.81	.80	.80
N of cases	18	9	8	18	20	16	0	20	22	18	8	22

Note. The number after the dimension signifies initial rating (1) or rerating (2).
Task dimensions are:
B = Electrical and Electronic Maintenance
D = Vehicle and Equipment Operations
H = Clerical
I = Communications
M = Individual Combat
N = Crew-served Weapons

[a]Number of MOS for which reliability estimates were available.
[b]Dimension N1 was not included in these analyses because it was not rerated by any MOS.

Differences Among Standard Setting Cutoffs

For the Task-Based Standard Setting instrument, there are five variables that can potentially impact on the standards selected. These include rater group differences in rank and command, differences among the MOS, differences among the dimensions, and differences between initial ratings versus the reratings. This section examines these potential differences when the standards are expressed in terms of percentile scores. The analysis procedure was similar to the parallel analysis conducted for the Behavioral Incident Questionnaire. That is, each rater-by-dimension-by-repetition questionnaire was treated as a case with the three performance levels treated as three "trials" in a repeated measures ANOVA. The variables of interest--rank, command, MOS, dimension, and repetition--were treated as grouping factors. Again, the between-subjects effects represent differences in strictness and leniency for the three cutoffs combined. The within-subjects interactions test the consistency of those effects across the three cutoff points. Civilians were excluded from the analysis.

Table 5.20 presents the results of this repeated measures ANOVA. Four of the variables (repetition, MOS, dimension, and rank) show statistically significant between-subjects effects. Furthermore, all five variables show statistically significant within-subjects interactions. Because of these interactions, separate ANOVAs were calculated for each of the three cutoff points. These results are presented in Table 5.21. They indicate that repetition, MOS, dimension, and rank effect the standards set for all three performance levels. Command, on the other hand, effects cutoff points only for the Marginal and Acceptable levels. Multiple $\underline{R}$s for these levels are .32, .29, and .28 for the Marginal, Acceptable, and Outstanding levels, respectively. Based on the sums-of-squares, the dimension effects appear to be the most influential.

Figures 5.6 through 5.15 graphically depict the results presented in Tables 5.20 and 5.21. Because many SMEs chose to think about their ratings only in terms of test scores, the figures present differences on test scores as well as on percentile scores. In each figure, standards are plotted for the indicated variable based on averages across the remaining variables. For example, MOS standards are computed using all raters, repetitions, and dimensions relevant to the MOS.

Considering these differences in light of the analogous differences for the Behavioral Incident Questionnaire, the MOS and dimension differences with the Task-Based method are more apparent. This suggests that the standards derived for the Task-Based instrument may be less generalizable than those from the Behavioral Incident Questionnaire.

Table 5.20

Rating Repetitions, MOS, Task Dimension, Rater Rank, and Rater Command Effects on Three Levels of Task-Based Standards

SOURCE	SS	df	MS	F	p
Between Subjects Effects:					
Repetition	6692.904	1	6692.904	16.450	0.000
MOS	20430.322	10	2043.032	5.022	0.000
Dimension	161419.533	5	32283.907	79.350	0.000
Rank	24134.890	1	24134.890	59.321	0.000
Command	1158.263	1	1158.263	2.847	0.092
Subjects w. groups	885723.180	2177	406.855		
Within Subjects Effects:					
Level	1027665.641	2	513832.821	8856.447	0.000
Repetition X Level	382.187	2	191.094	3.294	0.033
MOS	10452.031	20	522.602	9.008	0.000
Dimension	33624.534	10	3362.453	57.955	0.000
Rank	703.673	2	351.837	6.064	0.008
Command	615.726	2	307.863	5.306	0.015
Level x Subj. w. groups	252610.110	4354	58.018		

Table 5.21

Rating Repetitions, MOS, Task Dimension, Rater Rank, and Rater Command Effects on Each Level of Task-Based Standards

Source	SS	df	MS	F	p
Marginal Cutoff:					
Repetition	1972.524	1	1972.524	10.689	0.001
MOS	16963.413	10	1696.341	9.192	0.000
Dimension	88327.072	5	17665.414	95.727	0.000
Rank	4628.751	1	4628.751	25.083	0.000
Command	927.558	1	927.558	5.026	0.025
Error	401742.260	2177	184.539		
Acceptable Cutoff:					
Repetition	3874.983	1	3874.983	19.695	0.000
MOS	8108.024	10	810.802	4.121	0.000
Dimension	92687.551	5	18537.510	94.220	0.000
Rank	10085.702	1	10085.702	51.262	0.000
Command	846.076	1	846.076	4.300	0.038
Error	428317.892	2177	196.747		
Outstanding Cutoff:					
Repetition	1227.585	1	1227.585	8.669	0.003
MOS	5810.916	10	581.092	4.104	0.000
Dimension	14029.444	5	2805.889	19.815	0.000
Rank	10124.110	1	10124.110	71.496	0.000
Command	0.355	1	0.355	0.003	0.960
Error	308273.137	2177	141.605		

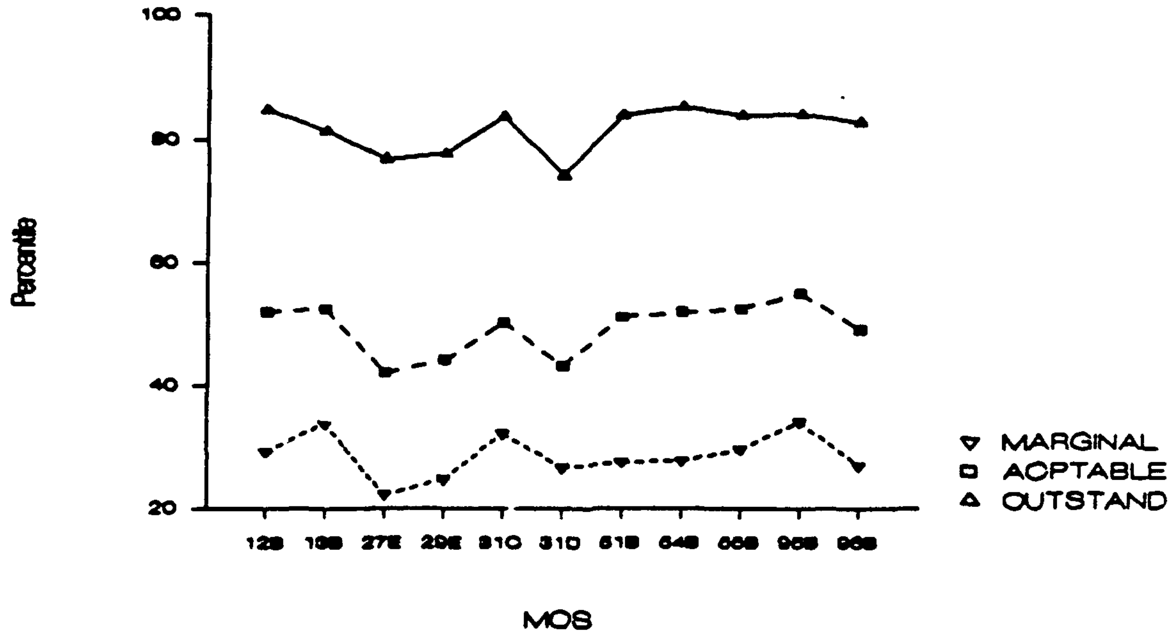

Figure 5.6. Task-Based percentile cutoffs for each MOS.

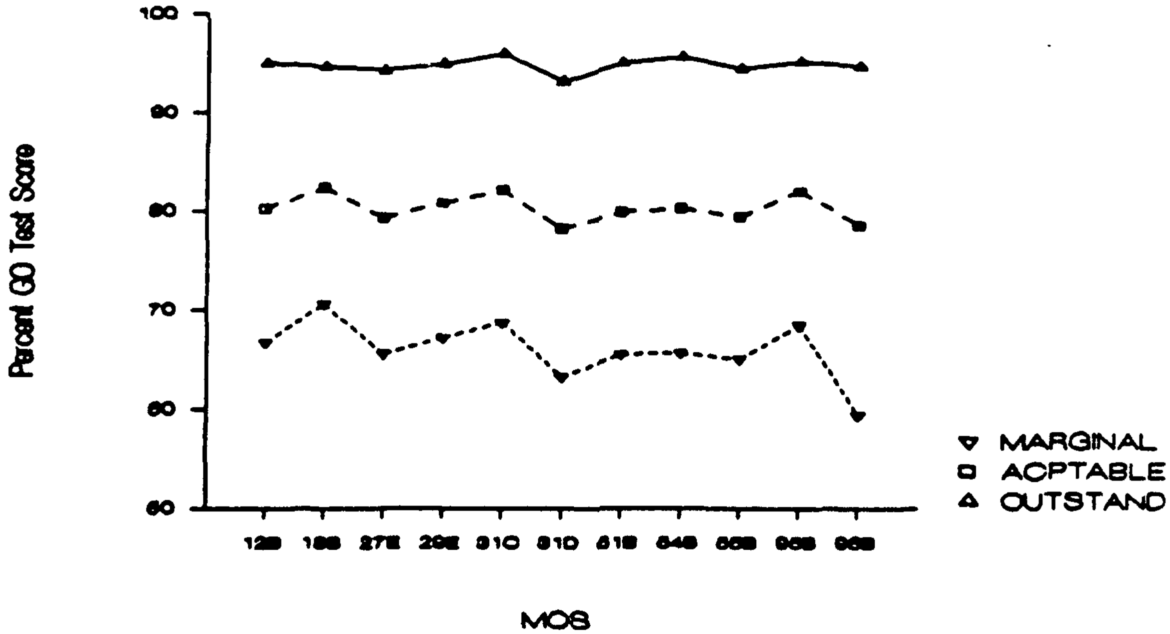

Figure 5.7. Task-Based test score cutoffs for each MOS.

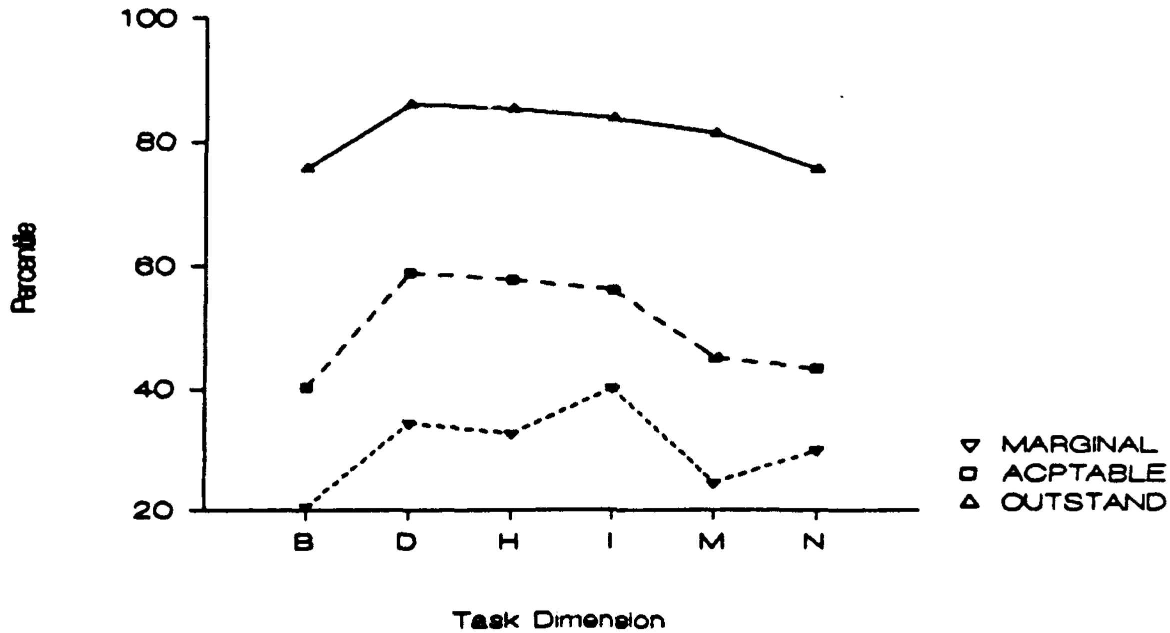

Figure 5.8. Task-Based percentile cutoffs for each task dimension.

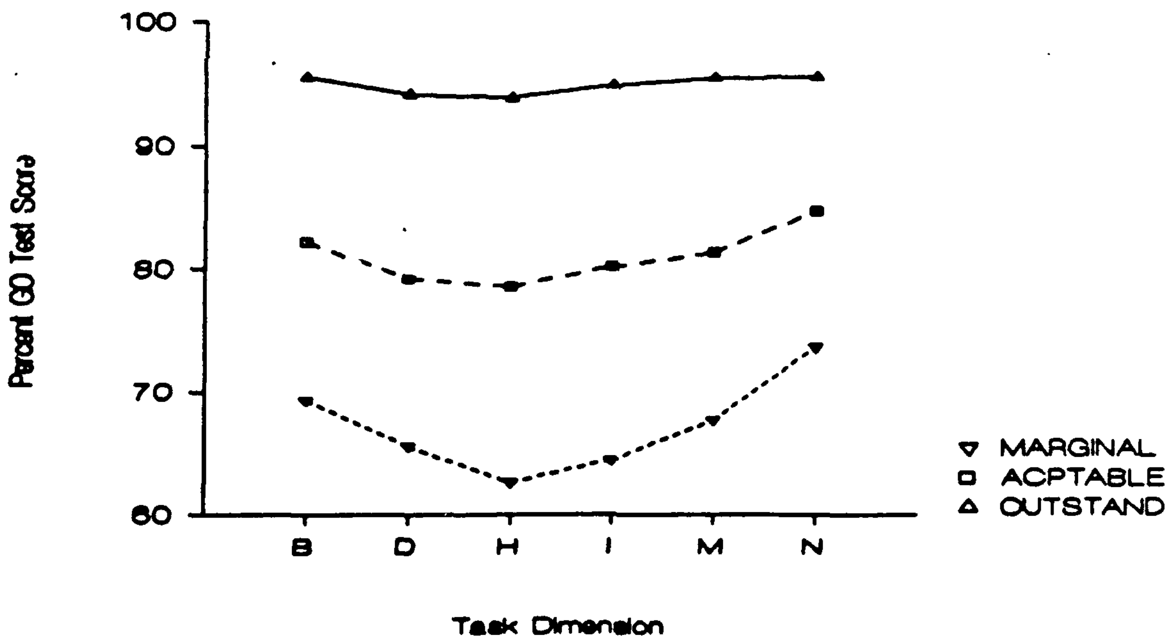

Figure 5.9. Task-Based test score cutoffs for each task dimension. (See Table 5.1 for Task Dimension names.)

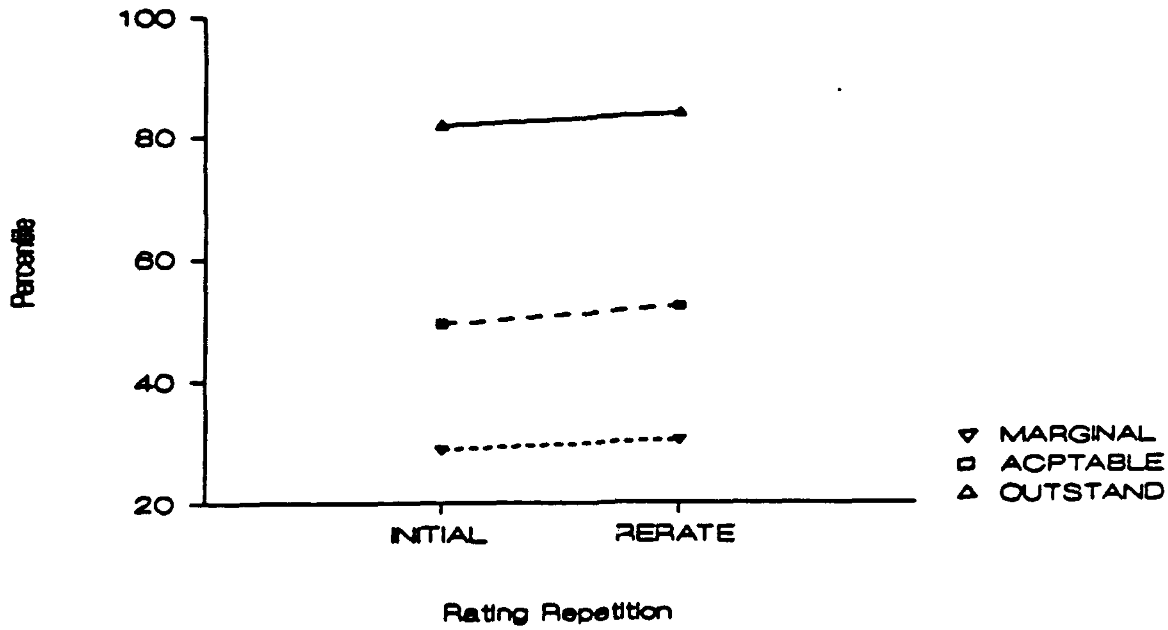

Figure 5.10. Task-Based percentile cutoffs for each rating repetition.

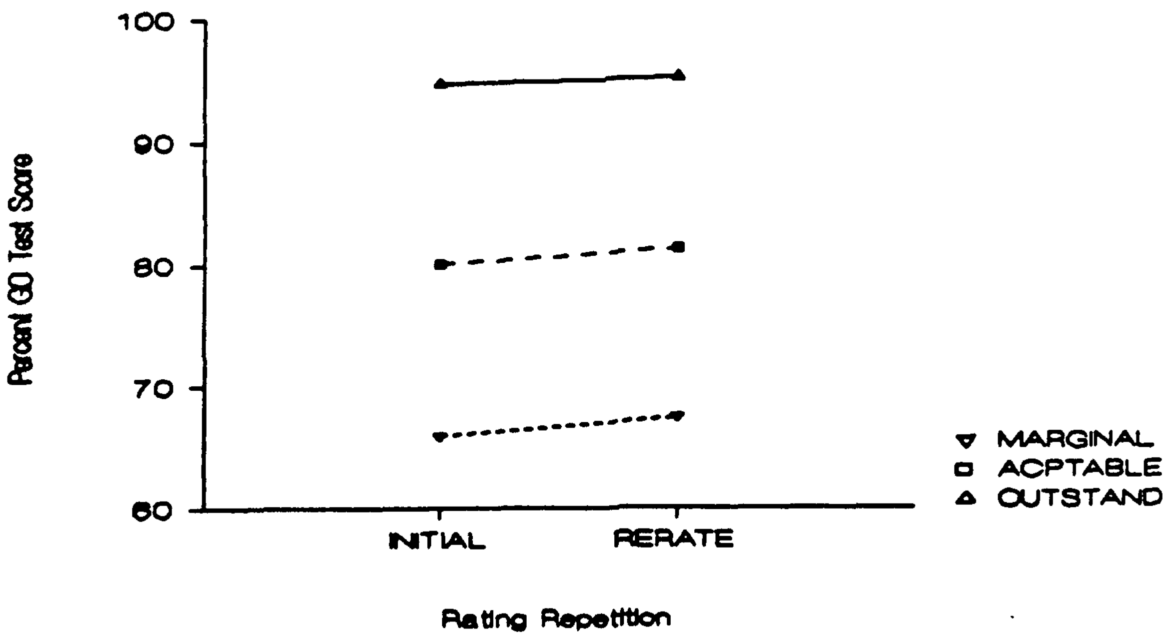

Figure 5.11. Task-Based test score cutoffs for each rating repetition.

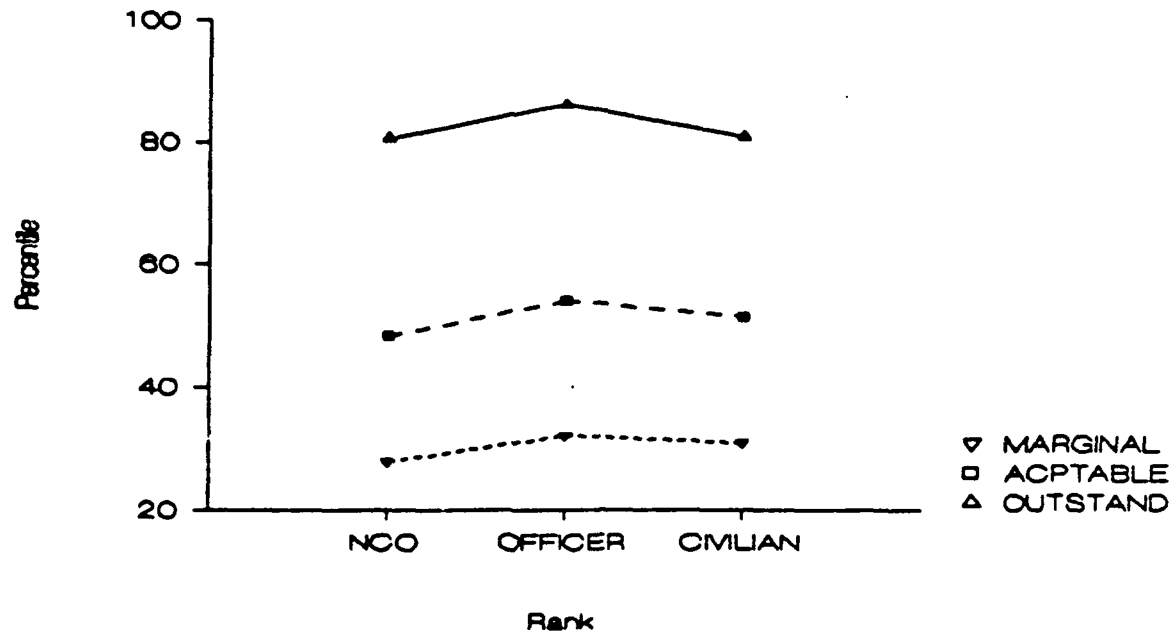

Figure 5.12. Task-Based percentile cutoffs for NCOs and Officers.

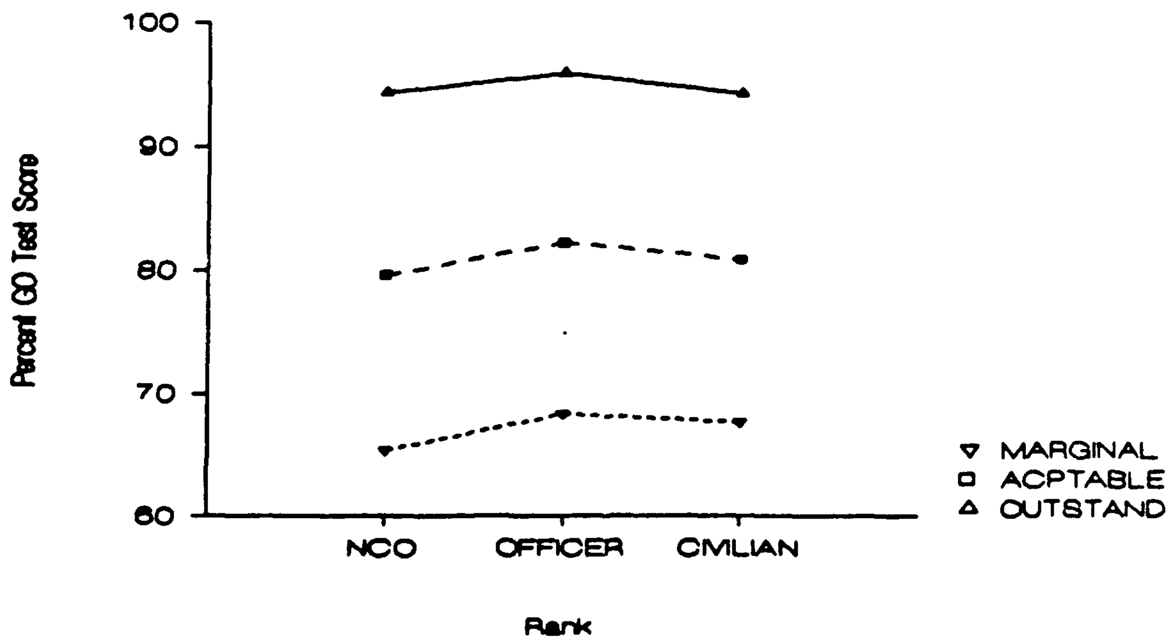

Figure 5.13. Task-Based test score cutoffs for NCOs and Officers.

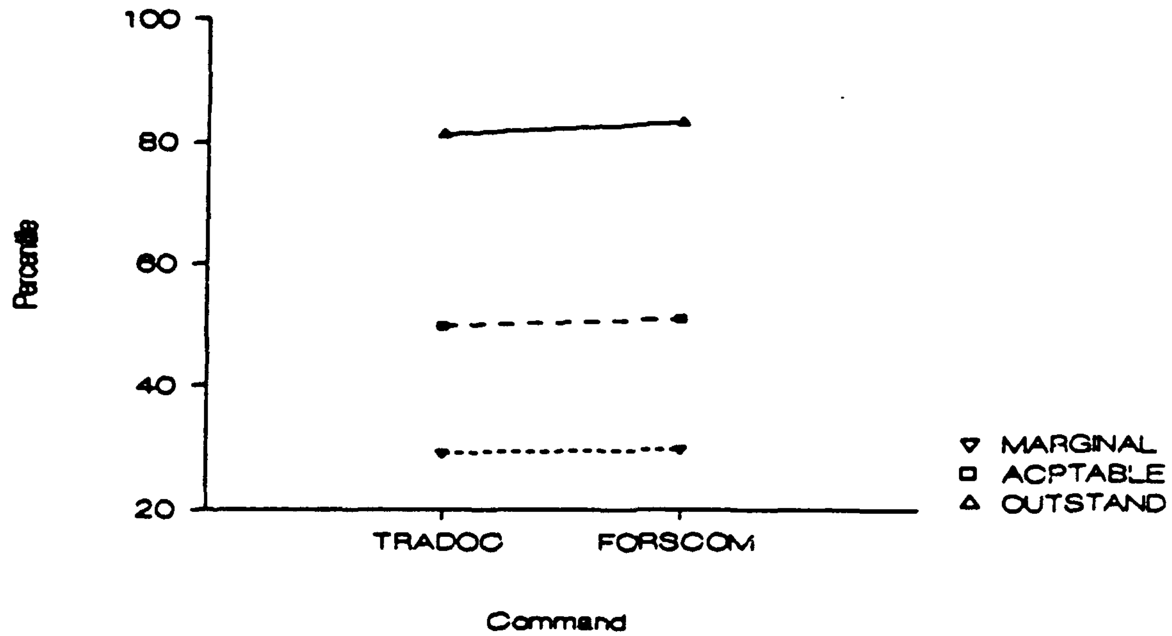

Figure 5.14. Task-Based percentile cutoffs for TRADOC and FORSCOM.

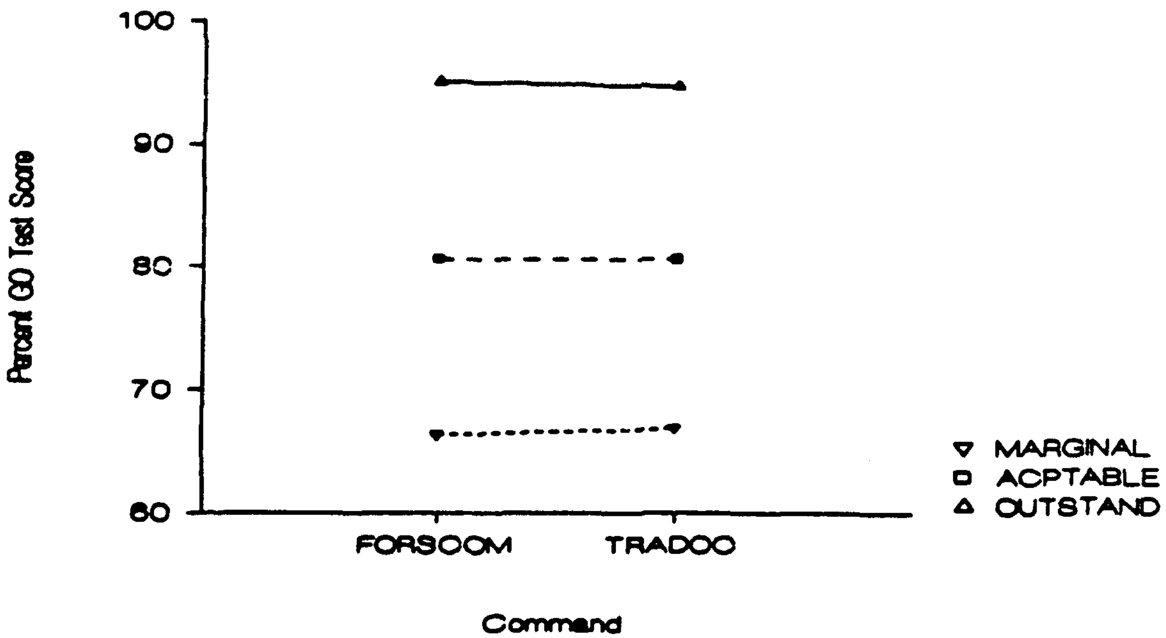

Figure 5.15. Task-Based test score cutoffs for TRADOC and FORSCOM.

Also of interest is the difference in this ordering between percentile cutoffs and test score cutoffs seen by comparing Figures 5.8 and 5.9. Because of the differences in Project A test performance distributions, the ordering of cutoff levels is almost reversed among the dimensions. Dimensions B (Electrical and Electronic Maintenance), M (Individual Combat), and N (Crew-served Weapons) have the highest cutoffs in terms of test scores but the lowest in terms of percentile cutoffs. Clearly, if SMEs are trying to express the need for higher quality soldiers by focusing on test score cutoffs, they may not be reaching their objective. On the other hand, the information at hand is incomplete in that the linkage of the performance distributions to the predictor distributions and the translation of performance cutoff to predictor cutoffs in not available. Without that information, it is not possible to definitively compare the leniency in standards across the different dimensions.

Other statistically significant differences include the initial versus rerate differences that were also observed in the MOS level statistics. Rerate cutoffs are slightly higher than initial cutoffs although the differences are unimpressive. There also appear to be observable rank differences with Officers to be the most strict and NCOs the most lenient. Finally, as suggested by the ANOVA results, the command differences are least remarkable.

Of the above differences in cutoffs the MOS and task dimension differences are the only ones large enough to be treated as different in practical terms. That means that rater group differences can be ignored. Thus, selection of raters falls back to the constituency issue discussed previously in Chapter 3. Selection of raters should primarily be driven by insuring representativeness for the sake of representativeness.

MOS and dimension differences in standards may be too large to ignore. It is important to note that the MOS effects are significant independent of the dimension effects and vise versa. On the other hand, dimensions were selected for MOS and therefore, by design, the two factors are confounded. Because of the confounding, general linear model analyses of any MOS-by-dimension interaction fail. Table 5.22 presents a summary of repeated measures ANOVA results conducted separately for each task dimension. These results show significant MOS main effects and/or significant MOS-by-cutoff level interaction effects for each dimension. (MOS-by-dimension means are presented in Table 5.15.) Taken as a whole, the pattern suggests that the MOS set different levels of standards and that these differences are not just a function of the dimensions being rated. Rather, the standards set are a complex function of both MOS and dimension. Thus, standards set for one MOS are unrelated to standards set for other MOS. Furthermore, standards set for one dimension are unrelated to standards set for other dimensions.

Table 5.22

Summary of the Effects of Rating Repetitions, MOS, Rater Rank, and Rater Command Effects on Task-Based Standards Separately for each Task Dimension

Dimension	Between-Subjects				Within-Subjects			
	Repet	MOS	Rank	Command	Repet	MOS	Rank	Command
B		X					X	
D	X	X	X			X		
H			X			X		
I		X	X	X		X	X	X
M	X	X	X			X		

Note. X = Significant effect ($p < .05$).

Dimension	Number of MOS	Number of Rating Sheets
B. Electrical	4	175
D. Driving	5	480
H. Clerical	4	203
I. Communication	5	325
M. Ind. Combat	11	952

Comparison of Behavioral Incident and Task-Based Standards

Table 5.23 presents mean standards derived from the Behavioral Incident Standard Setting Questionnaire and the Task-Based Standard Setting Form. The means were calculated from the MOS-by-dimension data ($n = 30$) presented in Tables 5.4 and 5.14. The Task-Based means were calculated from rerate standards for those MOS-by-dimension combinations with rerate data and initial standards otherwise.

The means across MOS and task dimension in Table 5.23 indicate that the two standard setting instruments are not producing the same results. These differences were tested once again using a repeated measures approach. The 30 unique MOS-by-dimension combinations were treated as cases and the cutoff values as repeated measures "trials." In this case, standard setting method (Behavioral Incident vs. Task-Based) and level of standard (Marginal, Acceptable, and Outstanding) were treated as two trials factors (i.e., partitions for the within-subjects trials variable). MOS and dimension were treated as grouping factors (i.e., between-subjects independent variables). Table 5.24 presents the results. Method differences are substantiated with Task-Based standards generally higher than Behavioral Incident standards. This conclusion is tempered by the significant interactions with MOS and task dimension. The MOS-by-Method-by-Level interaction is the only one that is not

Table 5.23

Mean Standards Set by Behavioral Incident and Task-Based Standard Setting Instruments

Standard Setting Instrument	Marginal	Acceptable	Outstanding
Behavioral Incident	6.03	38.91	77.57
Task-Based	29.00	49.11	80.17

Table 5.24

Tests of the Differences in Standards Set by Behavioral Incident Versus Task-Based Questionnaires

Source	SS	df	MS	*F*	*p*
Between-Subjects Effects:					
MOS	417.808	10	41.781	4.519	0.005
Dimension	1906.667	5	381.333	41.246	0.000
Subject w. groups	129.435	14	9.245		
Within-Subjects Effects:					
Method	2908.632	1	2908.632	330.257	0.000
MOS x Method	305.607	10	30.561	3.470	0.017
Dimension x Method	803.222	5	160.644	18.240	0.000
Method x Subjects w. groups	123.301	14	8.807		
Level	58159.617	2	29079.808	25728.220	0.000
MOS x Level	220.991	20	11.050	9.776	0.000
Dimension x Level	139.798	10	13.980	12.369	0.000
Level x Subjects w. groups	31.648	28	1.130		
Method x Level	1807.062	2	903.531	456.794	0.000
MOS x Meth x Level	48.513	20	2.426	1.226	0.304
Dim x Meth x Level	448.238	10	44.824	22.661	0.000
Meth x Level x Subjects w. groups	55.384	28	1.978		

significant. The interactions indicate that standard setting levels are influenced by a complex mix of the methods of rating and the MOS and task dimensions being rated.

Differences between the standard setting methods with respect to within-MOS rater agreements (i.e., within-MOS standard deviations) were also examined. Table 5.25 presents the average within-MOS standard deviation for each instrument for each performance level cutoff. Given that lower standard deviations indicate higher rater agreement, the Behavioral Incident method appears to produce greater agreement. The repeated measures results presented in Table 5.26 support those conclusions with a significant main effect for method. The level main effects and interactions also suggest that the raters have greater agreement for some levels of performance than for other levels.

<u>Army Task Questionnaire Difficulty</u>

The Difficulty scale from the Army Task Questionnaire was explored for its relevance to the standard setting problem. In providing Difficulty ratings, SMEs were asked to consider how long it takes to learn MOS relevant tasks within each task category and how often those tasks must be practiced in order to be retained. MOS with more difficult tasks may require higher ability soldiers. Thus, one might expect to find a positive relationship between task difficulty and standards, opening the potential for difficulty ratings to be surrogates for standards. Alternatively, based on SME comments during the Task-Based discussion sessions, one could anticipate that SMEs would be more lenient in the standards they set for tasks that are more difficult. This would lead to a negative relationship between difficulty and standards.

To examine the relationship between difficulty and standards, difficulty values were created for each MOS for the relevant task dimensions. This required consolidating MOS mean values on the 96 task categories into values for the 17 lettered dimensions that subsume the categories (see Figure 3.1). A procedure was applied to the MOS difficulty mean profiles that first defined as relevant only task categories with mean Core Technical or General Soldiering Importance ratings greater than or equal to 3.0. Then, from those relevant task categories within each dimension, the maximum difficulty value was selected to represent the difficulty of that dimension. Because all MOS set standards on Task Dimension M (Individual Combat) a difficulty value for Dimension M was created for all MOS regardless of Core Technical or General Soldiering Importance ratings. Dimensions with no relevant task categories for a particular MOS were given no difficulty values. The resulting difficulty values for all dimensions are presented in Table 5.27.

Table 5.25

Rater Agreement (Within-MOS Standard Deviations Across Raters) for Behavioral Incident and Task-Based Standard Setting Instruments

Standard Setting Instrument	Marginal	Acceptable	Outstanding
Behavioral Incident	7.51	8.00	12.31
Task-Based	13.18	14.06	12.79

Table 5.26

Tests of the Differences in Rater Agreement for Behavioral Incident Versus Task-Based Instruments

Source	SS	df	MS	F	p
Between-Subjects Effects:					
MOS	160.676	10	16.068	8.231	0.000
Dimension	.841	5	36.368	18.630	0.000
Subject w. groups	330	14	1.952		
Within-Subjects Effects:					
Method	483.924	1	483.924	48.320	0.000
MOS x Method	80.520	10	8.052	0.804	0.629
Dimension x Method	123.532	5	24.706	2.467	0.084
Method x Subjects w. groups	140.211	14	10.015		
Level	138.827	2	69.413	38.139	0.000
MOS x Level	95.493	20	4.775	2.623	0.009
Dimension x Level	260.693	10	26.069	14.324	0.000
Level x Subjects w. groups	50.960	28	1.820		
Method x Level	87.327	2	43.664	26.110	0.000
MOS x Meth x Level	67.620	20	3.381	2.022	0.043
Dim x Meth x Level	134.413	10	13.441	8.038	0.000
Meth x Level x Subjects w. groups	46.825	28	1.672		

Table 5.27

Task Dimension Difficulty Values for Each MOS

Dimension	MOS 12B	13B	27E	29E	31C	31D	51B	54B	55B	95B	96B
A	2.71	3.23	3.09	2.41	2.70	2.17	3.01	2.89	2.48	2.71	2.38
B			3.54	3.91	3.38	3.23					
C		2.59							2.83		
D	2.76	2.68	2.36	2.27	2.45	1.76	2.94	2.40	3.10	2.64	2.34
E					2.28	2.00	4.11				
F			3.18	3.12	3.35	3.17	2.93	2.87			3.24
G	3.29	3.00						3.04		3.29	3.03
H			2.45		2.90				2.88	2.91	2.70
I	3.26	3.27	3.06	3.00	3.07	2.82	3.16	3.09	2.68	3.45	3.59
J					3.34					3.41	4.16
K											
L											
M	3.68	3.36	3.15	3.02	3.22	2.37	3.57	3.34	2.93	3.54	2.93
N	3.14	3.42			2.19	1.87	2.86	2.64		2.58	
O	3.42	3.39	3.19	3.20	3.13	2.12	3.40	3.21	2.75	3.45	3.15
P	3.10							2.75		3.43	2.71
Q	3.54	3.09	3.06	2.83	3.28	2.93	2.93	2.83	2.42	3.35	3.30

<u>Note</u>. The dimensions are:
I = Communication
A = Mechanical Maintenance
N = Crew-served Weapons
O = First Aid
J = Analyze Information
K = Math and Data
E = Construct/Assemble
Q = Supervision
F = Technical Procedures
D = Vehicle and Equipment Operations
M = Individual Combat
P = Technical Drawings
C = Pack and Load
L = Air Traffic Control
H = Clerical
B = Electrical and Electronic Maintenance

These difficulty values were compared to the Behavioral Incident and Task-Based percentile standards by correlating difficulty values and standards across the 30 MOS-by-dimension combinations. Because of the inverted relationship between Task-Based percentile standards and Task-Based percent GO test score standards that appears in Figures 5.8 and 5.9, Task-Based percent GO test score standards were included in the present comparison. These correlations are presented in Table 5.28.

Table 5.28

Correlations between Behavioral Incident Cutoffs, Task-Based Cutoffs, and Army Task Questionnaire Task Dimension Difficulty Across 30 MOS-by-Dimension Combinations

	Behavioral Incident			Task-Based					
				Percentile Score			Percent Test Score		
	Marg	Acc	Out	Marg	Acc	Out	Marg	Acc	Out
Behavior Incident:									
Marginal	1.00								
Acceptable	.26	1.00							
Outstanding	.10	.76	1.00						
Task-Based, Percentile:									
Marginal	.07	.63	.57	1.00					
Acceptable	.09	.59	.57	.88	1.00				
Outstanding	.13	.50	.56	.63	83	1.00			
Task-Based, Score Cutoffs:									
Marginal	.43	-.11	-.15	-.09	-.20	-.05	1.00		
Acceptable	.35	-.15	-.08	-.16	-.26	-.04	.92	1.00	
Outstanding	.33	-.07	.12	-.20	-.21	.19	.69	.85	1.00
Army Task Questionnaire:									
Difficulty	.12	-.30	-.02	-.28	-.41	-.23	.45	.54	.56

The correlations may seem to present a contradictory picture. There is no consistent relationship between Behavioral Incident standards and dimension difficulty. On the other hand, difficulty is related to Task-Based standards, but in an interesting pattern that is apparently related to the inverse relationship between percent GO test score standards and percentile standards. For the set of MOS and dimensions at hand, dimensions with more difficult tasks are given higher test score (criterion-referenced) standards, but when those test scores are translated into percentile (norm-referenced) standards, we see the reverse. A fairly straightforward explanation can be offered for these results. Recall from Chapter 3 that Difficulty is positively correlated with Frequency and Importance. Given that, one may assert that the difficult task categories tend to be more important and more frequently performed or practiced. During the Task-Based discussions, SMEs indicated that soldiers should be expected to have higher performance on important and/or frequently performed tasks. Therefore, we observe positive correlations between difficulty and percent GO test score standards. Because these tasks are frequently performed, soldiers are better able to perform them. As a consequence, more soldiers score high on tests of such tasks; therefore, when task standards are expressed as percentile scores, cutoffs appear lower.

Notice that for the set of MOS-by-dimensions examined, there is a slight negative relationship between Task-Based percent GO test score standards and percentile standards (e.g., -.26 for the Marginal cutoffs). Given the explanation above, one could expect differences in dimension difficulty to account for that relationship. Indeed, holding Difficulty constant, the partial correlation between test score standards and percentile standards is -.02 supporting the argument that differences in Difficulty (and Importance and Frequency) lead to both higher test score standards and lower percentile standards.

Table 5.28 also provides further evidence that the Behavioral Incident Questionnaire and the Task-Based Standard Setting Form are not entirely convergent. The standards provided by the two standard setting instruments correlate .07, .59, and .56, respectively, for the three levels of performance. Again, the two instruments lead to different sets of standards.

Task Complexity Questionnaire

In Phase III, we also briefly explored a second approach of using task difficulty for determining selection requirements. This approach is motivated by the general lack of differential validity in the prediction equations for different jobs. The assumption in this approach is that a relatively univariate conception of "task complexity" could be established and that a measure of task complexity could be linked directly to aptitude requirement levels.

We developed a prototype Task Complexity Questionnaire to provide an indicator of cognitive ability requirement for a given task. The questionnaire was adapted from a model for predicting skill retention in task performance (Rose et al., 1984). The model consists of a systematic way of predicting the decay of performance in a single task so that training can be scheduled to restore acceptable task performance. Factors that contribute to defining the retention of task performance include the number of steps, presence of job aids, and the cognitive demands on the soldier. Each of these factors is posed to SMEs in the form of a question and the response options are weighted in terms of how likely task performance will be maintained. Based on the skill retention model, there are 10 factors that affect how well task performance will be retained.

We adapted these 10 factors in the form of the prototype Task Complexity questionnaire retaining the questions and response options for the most part. We asked our SMEs those 10 questions about particular tasks. An example of the questionnaire is found in Appendix A (pp. A-36 to A-40). It is important to note that our Task Complexity Questionnaire approach circumvents some of detail that is present in the original skill retention model data collection protocol where a group of SMEs provides a response to a question after they were explained the question and had an opportunity for discussion among themselves. Moreover, in the Task Complexity questionnaire, each SME was asked to provide complexity ratings on two tasks, a common task and a job specific task. Each job specific task was taken from one of the task dimensions used in the standard setting exercises (e.g., Vehicle and Equipment Operations).

Analyses of the Task Complexity questionnaire attempted to answer a basic question: Can judges agree on the demands and complexity of a task using a simplified rendering of the skill retention model?

<u>Scoring</u>. We used a simple scoring procedure for each of the 10 items. In all the questions, the response options were scaled from difficult to easy. Although the original skills retention model scoring applied differential weights to the response options, we used a simple scoring procedure where if there were three response options, we used 1s, 2s, 3s, and so forth to score responses from least to most complex. We computed a total score based on the sum of the 10 item responses.

<u>Judge Agreement</u>. Our early analyses showed that, for a selected job task, judges did not agree on the best option for each of the 10 complexity measures. The relatively large standard deviation for each item in a job indicated lack of agreement among the judges (see Table 5.29). These results in Table 5.29 typified the results that were obtained for other tasks (see Appendix G).

The task complexity model approach, was not convincing. Given the very rough nature of the tryout of this approach, we cannot conclude that it will not work. There is considerable appeal for an underlying model that task complexity is related to ability requirements. However, much more effort is needed to develop both measures of complexity and indicators of ability requirements before a better test of this approach can be conducted.

Table 5.29

Task Complexity Questionnaire Item Means and Standard Deviations for an Electrical and Electronic Systems Maintenance Task

	MOS			
	27E		29E	
Task Complexity Items	MEAN	S.D.	MEAN	S.D.
1. Are job or memory aids used?	1.28	0.46	1.17	0.38
2. Quality of job aids.	3.84	0.90	3.76	0.88
3. How many steps are task divided?	2.72	0.68	2.86	0.65
4. Steps performed in definite sequence?	3.24	0.44	3.07	0.38
5. Built-in feedback?	2.84	0.80	3.04	0.96
6. Timo limit for completion?	1.20	0.41	1.50	0.58
7. Mental processing requirements?	1.84	0.62	2.04	0.58
8. Number of facts, terms, etc. memorize?	2.08	0.86	2.46	1.04
9. How hard are the facts or terms?	2.08	0.28	2.25	0.52
10. What are the motor control demands?	1.92	0.64	2.32	0.61

Summary

The general objective of this chapter was to describe two potential instruments for setting performance standards which can in turn be used to evaluate selection standards. Specific objectives were to present qualitative feedback obtained from workshop participants, present reliability estimates, and present obtained standards with a description of some of the influences on those standards. In addition, the Army Task Questionnaire Difficulty scale and the Task Complexity Questionnaire were examined for their relevance to the standard setting problem.

The qualitative feedback reinforces the position that standard setting by its nature is complex, subjective, and ambiguous. By requiring SME to work in the abstract, instead of with a specific test, the Behavioral Incident and Task-Based instruments increase the complexity and ambiguity. Because of the discussion sessions, we have been able to describe rather thoroughly SME thought processes regarding completion of the Task-Based exercise. They presented a variety of thoughts and strategies. There is no reason to assume that SMEs were not equally diverse in their approaches to the Behavioral Incident judgments.

In spite of this variation, it is possible to pool SME judgments into stable performance standards. Because the instruments are not yet ready for operational use, there is no need to give precise estimates of reliability nor to give requirements for the size of the rater pool. At this point, it is sufficient to note that obtaining acceptable reliability does not appear to present any problem. Furthermore, differences between rater groups appear minimal (in the case of the Behavioral Incident Questionnaire) or non-existent (in the case of the Task-Based Form). As with the Army Task Questionnaire, selection of raters may be driven more by political concerns than by psychometric requirements.

Differences in Methods

The most noticeable difference among the standards occurs between methods, particularly for the lower level cutoffs where Task-Based standards appear much more strict for Marginal performance. Certainly, the standard setting problem would be simpler if the two methods converged. They do not, and perhaps an explanation can be gleaned from the SME comments. To lay some background, one should recall that the two standard setting methods were derived from two different Project A performance measurement methods--ratings and performance tests. In the Project A performance model (Campbell, McHenry, & Wise, 1990), ratings and performance tests are associated with two different domains. The performance tests, which are the referent for the Task-Based exercise, are clearly associated with the Core Technical and General Soldiering components which are skills related. The skill components are sometimes referred to as

"maximal" or "can do" performance and indicate what a soldier is able to do at a particular point in time.[2] On the other hand, the ratings, from which the Behavioral Incident Questionnaire were derived, are more closely associated with the Effort and Leadership component. This component is interpreted as indicative of "typical" or "will do" performance.

Based on SME comments documented in the Qualitative Feedback sections of this chapter, there appear to be differences in the initial dispositions of SME approaches to the two methods. The Behavioral Incident judgments asked SMEs to respond to the following question:

> If a soldier CONSISTENTLY performed duties in this area at a level of effectiveness like the example incident, what kind of soldier would this be?

This focus on persons, rather than on test scores, may have created a leniency in the "will do" arena. During the workshops, the notion of consistent performance had to be emphasized repeatedly by the instructions and workshop leaders to counter SME tendencies to give soldiers described by poor performance incidents "the benefit of the doubt." SME attributions seemed to be that the soldiers could have performed correctly, they just didn't happen to do so in the incident.

In contrast, the Task-Based method focused SME attention on task performance and away from individual persons. The judgment implied that SMEs assume a test situation in which soldiers should be showing their best performance. SME expectations, undoubtedly reinforced by typical Army training standards, were that if a task was important enough to test, soldiers ought to be able to perform it reasonably well. We have consistently seen the expectation that at least 60 to 70% of the steps in the task should be performed correctly. Even if the test includes scoring of trivial steps, performing less than 60 to 70% on any task means that a large proportion of the task was not performed or not performed correctly. Performance below that level is interpreted to mean that a soldier *cannot* (as opposed to *did not*) perform the task. Scores lower than 60 to 70% correct are simply not acceptable by any standard. This opinion holds up even after the implication that nearly 30% of the soldiers would be deemed Unacceptable is made clear during the discussion sessions. In fact, SMEs became slightly more strict on the rerating. They certainly did not lower their test performance expectations in light of the distributions.

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[2]These are maximal in the sense that performance on these tests is taken as maximal for a given point in time given a soldier's abilities and experiences. They are not necessarily "maximal" in the sense that aptitude tests are described.

As a result, we appear to have two different sets of standards each of which is logical from its own perspective. How much of a real conflict this situation presents depends on the solution to the linkage of performance and predictor battery distributions. Core Technical Performance, General Soldiering Performance, and Effort and Leadership are each predicted by (a) cognitive ability and (b) a temperament composite that includes interests and job reward preferences (McHenry, Hough, Toquam, Hanson, & Ashworth, 1990). However, the balance between the two predictors and overall predictability is different for the two skill factors versus Effort and Leadership. The Effort and Leadership component is less predictable overall (mean validity for nine MOS is .44) than the Core Technical and General Soldiering components (mean validities for nine MOS are .65 and .69, respectively). For Effort and Leadership, prediction from cognitive ability and the temperament composite are nearly equal, whereas prediction of the Core Technical and General Soldiering components are more heavily weighted by cognitive ability. Thus, what the differences between the two sets of performance standards mean for evaluating predictor standards is clouded by differences in the way predictor domain is associated with the performance components most closely related to each set of standards. In addition, there may be regression intercept differences for the two domains that nullify (or magnify) performance standard differences when translated to predictor differences.

Task Dimension Differences

Dimension differences are statistically significant for both standard setting methods although they appear more pronounced for the Task-Based standards. On the one hand, this seems logical given our arguments concerning differences in frequency, difficulty, and standards. That is, frequent (and difficult) dimensions are given different standards than infrequent (and less difficult) dimensions. On the other hand, these differences in dimension standards pose a problem because they indicate that standards should be set explicitly for each relevant dimension. Standards for one dimension cannot be generalized to other dimensions. The problem is that Project A data from the nine Batch A MOS are required for constructing and scoring both the Behavioral Incident and Task-Based instruments. Given the present approach, instruments cannot be constructed to cover task dimensions that are not part of those nine MOS. For the Task-Based instrument, the performance distribution differences between dimensions indicate that appropriate performance data may be required for each dimension. To the extent that performance distributions for any given dimension are similar across MOS, there is some savings. Not all MOS would have to be studied; however, MOS would have to be sampled--with performance test written and administered--in order to study all dimensions. On the other hand, we have not established that performance distributions are similar across MOS.

The problem of generalizing standards across dimensions is less troublesome for the Behavioral Incident approach. First, the dimension differences, although statistically significant, are smaller than for the Task-Based standards, particularly for the Acceptable and Marginal cutoffs. Second, we have shown that the Behavioral Incident approach does not depend on performance rating data because the transformation of incident scale values to percentile equivalents appears to hold across different dimensions. On the other hand, the approach does require incidents that have been scaled. Thus, unless dimension differences are ignored, dimensions that cannot be covered by incidents from the nine Batch MOS-specific BARS scales will have to be constructed from newly developed and scaled incidents.

Given the above limitations on the two standard setting methods, perhaps the Army Task Questionnaire Difficulty scale and the Task Complexity Questionnaire merit a second look. For example, standards might be set for dimensions that can be constructed from Project A data. Then, based on relative differences in difficulty, standards may be estimated for missing dimensions from standards set for the existing dimensions. While not the best solution, it may be the most cost effective because neither additional performance tests nor rating scales would have to be developed.

Finally, it remains to be seen whether any of these dimension differences make any real difference. In the previous chapter, we saw that MOS level differences in ability requirements are elusive when we do not have empirical data to capture them. Part of this failure to discriminate the MOS is due to the multifaceted nature of all of the MOS; they have a lot in common. Because the 17 task dimensions are organized as multifaceted task components, we may also expect many of the task dimensions to share overlapping ability requirements. Further work would be required to map task dimensions to ability requirements and make projections about the extent to which dimensions are unique in terms of those abilities. If the different task dimensions are as recalcitrant in yielding identifiable ability differences as the MOS, the only requirement for standard setting may be to set standards for the most important dimension. Note that this may lead to higher percent GO test score standards and lower percentile standards for the more important (and more difficult) dimensions, but they are standards that are "validated" in the sense that current training practices demonstrate achievable proficiency levels.

In summary, we have been able to explore the complexities of attempting to set standards for performance that are independent of particular test content. Although we have certainly not solved the problem, we have identified some of the parameters that need to be addressed in future efforts, and we have provided some guidance concerning issues that need further examination.

Chapter 6: Linkage

Lauress L. Wise (AIR)

The ultimate goal of the present research on procedures for setting performance standards is to provide information for setting and defending selection test score requirements. Synthetic validation procedures can identify which abilities and other attributes are most predictive of success on the job and can estimate the level of prediction accuracy that can be achieved using measures of these attributes as predictors. The final step in developing selection procedures for specific MOS is to determine the minimum levels of these abilities that should be required. Thus, performance standards must be linked with selection standards.

Issues in Linking Selection Standards to Job Performance

A number of important issues must be addressed in developing procedures for setting minimum enlistment standards. These include:

- Identification of the performance dimension(s) for which performance standards will be set,
- Determination of the acceptability of different levels of performance, and
- Identification of the predictor composite that will be used to select applicants into the job,
- Selection of a bivariate model for deriving an expected distribution of job performance levels from any given distribution of predictor scores,
- Estimation of the parameters of the expectancy model relating job performance to enlistment test scores,
- Determination of the percent of failures that the Army is willing to tolerate.

The present project primarily addressed the first three issues in the above list. In this section of the report, we discuss each of the linkage issues, describing efforts in the Synthetic Validation Project as well as in other projects to develop a more complete linkage between selection measures and performance.

Performance Dimensions

Results from Project A indicate that job performance can be summarized in terms of five dimensions (Campbell, McHenry, & Wise, 1990). These are: (a) core technical proficiency,

(b) general soldiering proficiency, (c) effort and peer leadership, (d) personal discipline, and (e) physical fitness and military bearing. The Army currently uses multiple selection screens and these screens correspond, approximately, to the multiple performance dimensions defined in Project A. This relationship is shown in Figure 6-1. Within the present project, we focused on setting performance standards for core technical proficiency and then relating these standards to current and alternative Aptitude Area composites. As described in Chapter 5, we identified a number of specific performance dimensions similar to those identified in creating the Project A MOS-specific BARS and set standards for performance on each of these dimensions. In Phases I and II of the Army Synthetic Validity Project, we explored the relationship of standards set on individual job performance dimensions to overall performance standards and found that overall acceptability levels could be approximated quite closely by averaging the acceptability of performance on each of the more detailed dimensions.

Performance Acceptability Levels

As described in Chapter 5, we defined four levels of acceptability for use in setting job performance standards. We used two different approaches, Task-Based and Behavioral Incident, to describe different levels of performance and elicit judgments regarding the acceptability of each performance level. The resulting judgments were converted first to minimum acceptable performance scores and then to percentile scores as described above.

Predictor Composite

Identification of the most appropriate composite for predicting core technical proficiency was the focus of the synthetic validation portion of this project. The results, described in Chapter 4, indicate that highly valid predictor composites can be produced through this process, although discrimination among jobs is minimal. In the present project, we used both the current Aptitude Area composite and the alternative composite identified through synthetic validation as the predictor composites of interest. The present Aptitude Area Composites are scaled to have a mean of 100 and a standard deviation of 20 for the 1980 Youth Population. We are assuming that new composites would be placed on a similar scale. Selection cut scores and predictor score distributions for the Project A samples are then described in terms of this metric.

Bivariate Model

The bivariate model that we developed for relating performance levels to predictor score distributions had two components. The first component related performance levels to an underlying continuous performance measure by assuming a set of cut scores that defined minimum acceptable performance levels

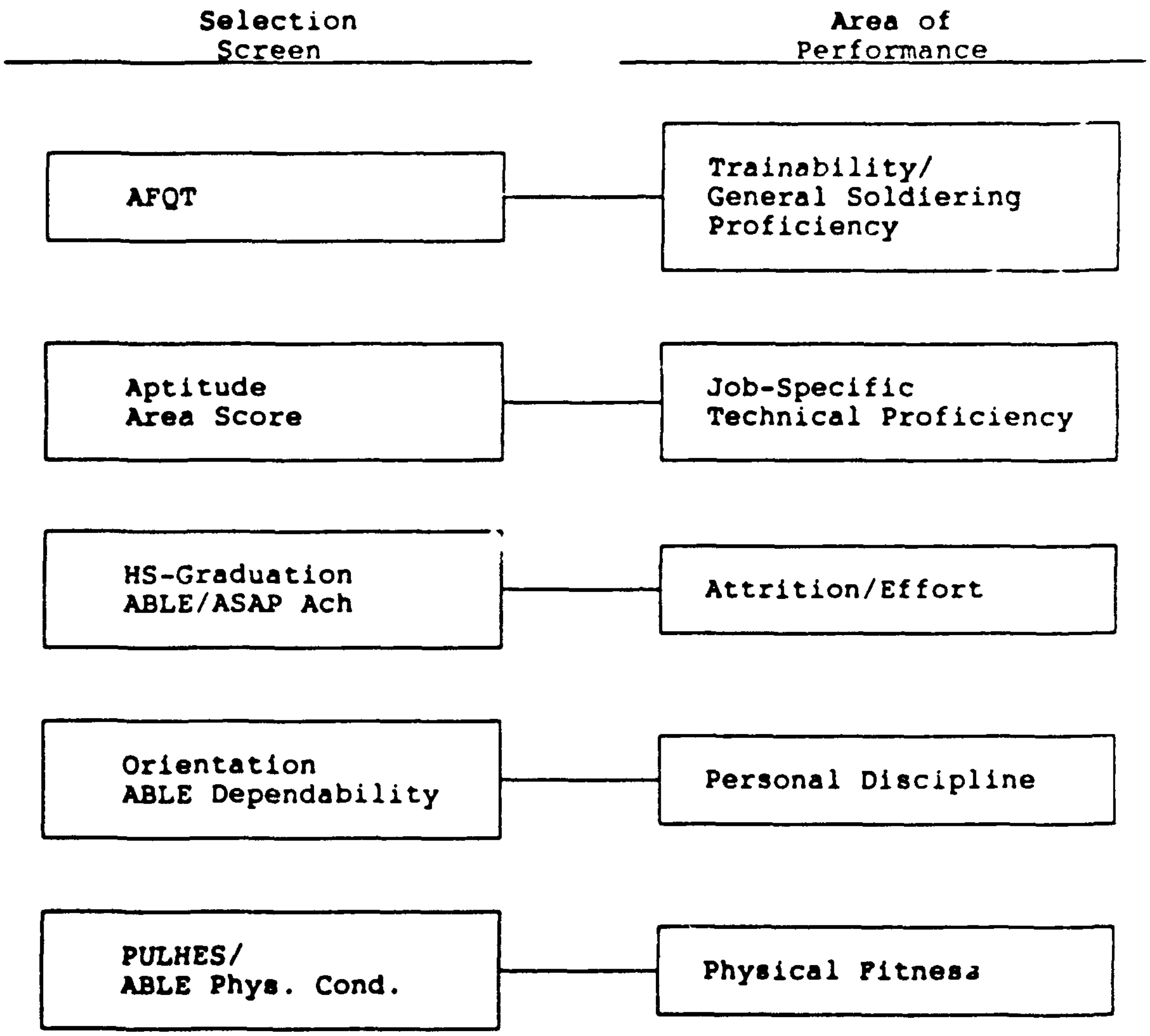

Figure 6.1. Matching different areas of performance to different selection screens.

along this continuous dimension. The second component was a model for relating the underlying performance scores to enlistment test scores. For this second component, we chose to follow the standard relational model used in most regression analyses. This model assumes that the predictor and criterion variables, taken together, have a bivariate normal distribution. This assumption is equivalent to three important conditions. First, the marginal distribution of both the predictor and criterion measures have a normal distribution (for some reference population). Second, the relationship of the criterion to the predictor is linear. (The function giving the average criterion score for all individuals with the same predictor score will be a

linear function of the predictor score.) Finally, the conditional variance of the criterion variable (the variance about the prediction regression line) is constant throughout the range of the predictor variable. Given the two relational models and the criterion cut scores, performance level distributions (the percent performing at each acceptability level) can be estimated for any given predictor score level and also for any distribution of predictor scores through numerical integration techniques similar to those used in developing the Taylor-Russell tables (Taylor & Russell, 1939).

These conditions assumed in the relational model are met, at least approximately, in most of the Project A data samples. The primary exception is that the criterion measures are sometimes slightly skewed. This is not an important violation of these assumptions, however. The job performance metric used is entirely arbitrary, dependent on the particular items/tasks selected, the difficulty of the questions or performance steps used in assessing these items/tasks, and the severity of scoring. We can transform the performance scale so that the sample will have a normal distribution without any loss of generality.

A second possible exception to the conditions of the bivariate normal model is that measurement error may not be uniform so that the homogeneity of variance assumption does not hold exactly. In general, regression methods are relatively robust to violations of this assumption. In the present case, significant violation of this assumption could lead to some bias in the percentage of recruits expected to pass or fail a particular performance standard. The effects of such violations would be more significant when the predictive relationship is weak (so that the error variation accounts for more of the total variation of the criterion variable). For most MOS, the predictive relationship is quite strong, again arguing that the effects of violation of the homogeneity of variance assumptions will be minimal. Nonetheless, further research on both the linearity and homogeneity of variance assumptions might be useful before the proposed linkage system is used operationally.

Estimation of Parameters

Estimation of the parameters of the relational model turns out to be a very difficult problem. Project A provided extensive data on both performance measures and a wide variety of potential predictor measures, but these data are limited to just the 19 MOS in the Concurrent Validation phase of Project A. What can be done about all of the other (more than 250) MOS for which enlistment standards must be set?

The primary approach pursued in developing parameter estimates followed the general approach used in synthetic validation. For each job, core technical proficiency was broken down into a set of more detailed performance components. The detailed components were selected from the total set of

components measured in Project A. Two different bases were used in defining the detailed components. First, we examined the Project A MOS-specific rating scales, with each scale defining a separate performance component. Second, we examined the tasks selected for hands-on testing and sorted them into the components defined by the rating scales. The result of this process was a set of 17 dimensions that were somewhat more general than the detailed elements used in the Task-Based job descriptions, but for which an approximate correspondence could be established. The advantage of these more general composites was that empirical data on performance from Project A were available at this level of detail.

The general model underlying our "synthetic" approach to standard setting had two main assumptions. First, it was assumed that the job performance components could be described in such a way that their relationship to the predictor measures (ability levels) was constant across jobs. This means that data from Project A could be used to link performance (in terms of specific behavioral incident effectiveness levels or specific task percent GO levels) to predictor score levels for all MOS for which the dimension was relevant, not just for the Project A MOS. Note, however, that we did not assume that a given performance level had the same degree of acceptability for all jobs, only that it related to the same ability levels for all jobs.

The second assumption used in our "synthetic" approach was that the different detailed performance dimensions were "compensatory", so that the acceptability of overall performance could be determined by averaging the acceptability of performance on each of the detailed dimensions. This assumption was strongly supported by data collected during Phase I and Phase II in which judges were told the acceptability of performance on individual dimensions and asked to rate overall acceptability. The results indicated that a compensatory model accounted for virtually all of the variance in the outcome ratings (Szenas & Wise, 1989).

Given these assumptions, the steps that we used to estimate the parameters of the relational model were as follows:

Cut Scores

We determined acceptability cut scores for each detailed performance dimension as described in Chapter 5, using both a "percent GO" metric (for the Task-Based method) and an effectiveness level metric (for the Behavioral Incident method). We determined the percentage of the relevant Project A sample(s) who scored below (or above) each cut score putting the results from the two approaches onto a common metric. This resulted in three cut scores, dividing the four acceptability levels (from Unacceptable to Outstanding) for each combination of method and dimension. We then averaged these percents across the different performance dimensions and methods used with a given MOS.

Performance Score Metric

We created a "generic" performance scale converting from the percentile metric derived in the previous step to a metric on which performance scores would be normally distributed. We used the inverse normal distribution function to convert cut scores in a percentile metric (percent of soldiers below a given cut score) to "z-scores" for which the distribution of the Project A sample members would have a mean of zero and a standard deviation of one. At this point, the scale was arbitrary. The important considerations were that performance distributions would be approximately normal and that the cut scores were positioned correctly relative to the distribution of performance in the Project A samples. It might have been meaningful to convert back to either the percent GO or the effectiveness level performance metrics, but performance distributions on these metrics were sometimes skewed. Consequently, a bivariate normal model for relating performance scores to predictor scores might not fit well. In any event, final results would be displayed in terms of acceptability levels so that the metric for the underlying performance dimension did not matter.

Regression Parameter Estimates

We estimated the regression line slope to be: b = R * Sy / Sx, where R was the overall validity estimate using overall core technical proficiency as the criterion; Sy, the criterion standard deviation, was unity for the Project A sample; and Sx, the predictor standard deviation, was estimated from the same Project A sample. We estimated the regression line intercept to be: c = My - b * Mx, where My, the criterion mean, was zero by assumption, b was the regression slope estimated in the previous step, and Mx, the predictor mean, was estimated from the Project A sample. Finally, we estimated the prediction error variance to be: Ve = Vy * (1 - R**2), where Vy, the criterion variance, was again unity by assumption and R was again the estimated validity.

Determination of Maximal Failure Rates

Exact determination of acceptable failure rates necessarily involves a detailed cost-benefit analysis, trading off the cost of higher levels of selectivity against the benefit of reduced failure rates. Such analyses are the primary focus of a major new project being supported by the Office of the Assistant Secretary of Defense (Force Management and Personnel). In the present project, we used the average percent unacceptable and percent less than fully acceptable from the standard setting exercises to define maximum failure rates.

Demonstration Software

We developed a computer program to demonstrate the linkage model that was just described. The program uses a database with the linkage relationships estimated for the MOS included in this

project. This database includes performance cut scores for each MOS and also regression slope, intercept, and error variance parameters. The user may vary additional parameters, including the selection test cut score, the validity of the predictor composite, and the distribution of predictor scores among applicants. The program then displays the percentage of recruits expected to perform at each level of acceptability. In an alternate mode, the user may specify an expectancy requirement (e.g., maximum percent Unacceptable, minimum percent Outstanding) and the program will determine the minimum selection test score that will meet the requirement. In either case, the program also displays expected selection rates and the number of applicants that must be tested in order to achieve desired numbers of new recruits.

Figure 6.2 shows the display screen from the demonstration linkage program. The screen heading credits the Synthetic Validation Project and identifies the MOS for which linkage parameters are displayed. The upper "box" shows the expected number and percent of recruits at performance acceptability level. The total number of recruits can be set to specific annual goals or left to a default value of 1,000. The lower box shows the assumptions used in developing the expected performance level estimates. Some of the assumptions are derived from other assumptions. The percent qualifying is derived from the minimum qualifying score and the applicant AA score mean and standard deviation. The number of applicants needed is, in turn, derived from the required number of accessions and the percent qualifying.

Figure 6.3 shows the screen when "Change Assumptions/ Constraints" is selected. The menu at the bottom of this screen lists the changes that may be made by the user. Option 3, performance requirements, requires further explanation. It allows the user to specify a minimum percent acceptable or outstanding or a maximum percent unacceptable. The program then estimates the smallest "minimum qualifying score" for which the performance requirement will be met. If other parameters, such as estimated validity, are changed, the program continues to work backwards to compute minimum qualifying scores. Reverse mode is terminated if a new minimum qualifying score is specified.

The demonstration program is not intended to be used at this time for setting qualifying scores. The assumptions involved in computing the estimated performance levels are numerous and complex. Further development and validation would be required before this program is used in a "production" mode. The primary value of the program is that it illustrates the data and assumptions that are required in creating a linkage and allows users to explore the interplay between various factors involved in the linkage such as validity, performance cut scores, and selection ratios.

Simulated Linkage of Aptitude Area Composites to Expected Performance Levels
Developed for the Army Synthetic Validation Project

MOS: 11B - Infantryman

Expected Distribution of Job Performance							
Unacceptable		Marginal		Acceptable		Outstanding	
Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.:
20	2.0	275	27.5	569	56.9	136	13.6

Current Assumptions

Aptitude Area Composite Used:	CO	Estimated Validity:	50
Applicant Aptitude Area Score Mean:	100	Standard Deviation:	20.0
Minimum Qualifying Score:	90	Percent Qualifying:	69.1
Required Number of Accessions:	1000	Applicants needed:	1446
Performance Requirements: None			

Next Action:
1. New MOS
2. Change Assumptions/Constraints
3. Print Current Screen
4. Exit Program

Your choice:

Figure 6.2. Initial screen from Linkage demonstration software.

Simulated Linkage of Aptitude Area Composites to Expected Performance Levels
Developed for the Army Synthetic Validation Project

MOS: 11B - Infantryman

Expected Distribution of Job Performance							
Unacceptable		Marginal		Acceptable		Outstanding	
Number	Pct.	Number	Pct.	Number	Pct.	Number	Pct.:
20	2.0	275	27.5	569	56.9	136	13.6

Current Assumptions

Aptitude Area Composite Used:	CO	Estimated Validity:	50
Applicant Aptitude Area Score Mean:	100	Standard Deviation:	20.0
Minimum Qualifying Score:	90	Percent Qualifying:	69.1
Required Number of Accessions:	1000	Applicants needed:	1446
Performance Requirements: None			

Next Action:
1. Minimum AA Score
2. Selection Test Validity
3. Performance Requirements
4. Number of Accessions Required
5. Applicant Means and S.D.s
6. No changes

Your choice:

Figure 6.3. Change assumptions/constraints screen.

Summary

The linkage methodology described in this section, while it requires a large number of assumptions, appears workable given adequate estimates of: (a) percent of incumbents performing at each acceptability level, (b) predictor score distributions for these same incumbents, and (c) a validity estimate for the predictor score. The linkage methodology provides approximate failure rate estimates for different combinations of validity, selectivity, and acceptability. Exact procedures for setting selection cutoffs would require evaluation of the costs and benefits associated with different failure rates.

Chapter 7: Summary and Discussion

Norman G. Peterson (PDRII), Lauress, L. Wise (AIR), and John P. Campbell (HumRRO)

The Synthetic Validity Project developed and evaluated a series of alternative procedures for: (a) analyzing jobs in terms of their critical components, (b) obtaining expert judgments of the validities of an array of individual attributes for predicting the critical components of performance, (c) establishing prediction equations for specific jobs when criterion-related validation data is not available, (d) estimating criterion referenced performance standards for specific jobs, and (e) specifying scores on the predictor battery that would be necessary to achieve the desired performance standard, given the bivariate distribution between predictor scores and performance scores. The work of the project was firmly grounded in previous research and theory and two main literature reviews were produced, one on synthetic validation (Crafts, Szenas, Chia, & Pulakos, 1988) and one on setting performance standards (Pulakos, Wise, Arabian, Heon, & Delaplane, 1989).

The project began with three alternative procedures for analyzing jobs, three major methods (with variations) for generating prediction equations, and three principal scaling procedures for estimating performance standards. The evaluations of the competing methods proceeded iteratively through three major phases. After Phases I and II, some methods were dropped from consideration, others were revised, and additional parameters were designed into the evaluation. In general, procedures were evaluated in terms of their reliabilities, distributional properties, and discriminant and convergent validities. For the prediction equations, the absolute level of validity generated, the discriminant validity across jobs, and the correspondence of the synthetic or transported equations to the job specific empirical results were of special interest. For the standard setting investigation the relative stringency of the standards across methods and across MOS were of particular interest.

Because the relevant empirical data were expert judgments, relatively large samples of judges were used in each phase across a larger number of jobs than had been used in any previous study. This permitted a number of parameters of both jobs and judges to be investigated. The availability of the Project A concurrent validation data provided an unprecedented opportunity to compare alternative synthetic methods to actual empirical results and to anchor performance standards in known performance distributions. As a result, the Synthetic Validity Project was able to investigate a number of issues that had never been addressed before. While the answers are no means definitive, a great deal was learned, new issues were identified, and certain

recommendations can be made about future use of the methods. These have been discussed in some detail in the preceding chapters, but the major findings and their implications are summarized below.

Job Analytic Methods for Synthetic Validation

As a consequence of the results obtained in Phases I and II, the attribute model and the job behavior method were set aside and the Army Task Questionnaire became the procedure of choice. While all methods provided very reliable descriptions, the task questionnaire yielded greater discriminability across MOS and seemed to have higher acceptability among the judges.

Although we settled on job tasks as the descriptive unit, the other types of components did not perform poorly. The job task method was the best of a set of good options. Several different types of item response scales for job component questionnaires were compared, but they were very highly correlated. However, collecting separate task importance ratings of the Core Technical, General Soldiering, and Overall Performance aspects of the job does appear to be crucial for an effective job analysis. Although there were some very slight differences between subject matter experts' judgments, differences in the supervisory level of SMEs and their organizational point of view (a training orientation vs. an operational unit orientation) appear to make virtually no difference in the usefulness of the job analysis data for the purpose of forming synthetic prediction equations.

Synthetic Equations

Judgments about the validity of human attributes for predicting job descriptor elements proved to be particularly robust across judges who differed across a fairly wide range of relevant psychological training and experience. In terms of the validity of equations developed from those judgments, it appears that as long as the judges have some graduate level psychological training and a minimum amount of relevant research experience, then there will be no practically significant differences in the validity of the synthetic equations developed from the judgments. With regard to forming synthetic equations, weighting methods that set judgments of predictor validities with low values to zero appear to improve the discriminant validity of the resulting equations, with perhaps a slight cost in absolute validity.

The synthetic validation methods produced equations that have only slightly lower absolute validities than least squares equations developed directly on the jobs themselves depending on the criterion and method of forming the synthetic equation. It appears that the synthetic equation achieves levels of absolute validity that are about 96% of those achieved with least squares equations developed on the MOS, and levels of discriminant

validity that are about 33% of those achieved by the least squares equations.

More importantly perhaps, the synthetic equations produce results very similar to more traditional validity transportability methods when both methods are applied to the problem of identifying an appropriate prediction equation for a job for which no empirical validation can be undertaken. In this case, the best level of absolute validity/discriminant validity obtained by synthetic methods is .65/.02, whereas the best method for transportability (a "MOS-match" method) produces values of .67/.03. However, the MOS-match method may nct always produce an acceptable equation--that is, a new MOS may not correlate highly enough (in terms of Army Task Questionnaire profile correlations) with an existing MOS to warrant confidence in the use of an associated equation. The synthetic method will always produce an acceptable equation in the sense that it uses all the information supplied by the SMEs to form the equation. Both methods require the collection of Army Task Questionnaire data from SMEs for the MOS for which an equation is to be developed. Psychometrically, 10-15 SMEs would be sufficient, however, politically a larger number should be used to insure representation of all important constituencies.

What should the Army do when it must select or develcp a prediction equation for an MOS for which empirical data are not available, because the MOS is new, or because empirical validation research cannot be carried out for an existing MOS? Based on the research described here, we can say that there are several good options available but no clear-cut choice between them. The synthetic method, the "MOS-match" method, the "cluster-match" method, and the "general" method all produced absolute validities over .60 but no discriminant validity greater than .02. An excellent opportunity to collect additional information about the robustness of these methods will present itself in the ongoing Career Force project. The prediction equations developed in the current project can all be applied to the data developed on that project. These analyses will provide information about the generalizability of the various equations across different samples of soldiers and across a different validation design (concurrent vs. longitudinal). The synthetic equations tested here used no sample-based data in their development, whereas all the other methods used least squares optimization. It may be that the synthetic equations will maintain their absolute and discriminant validity levels better than the other methods.

What do these results mean for personnel research in general? First, the statement made by Mossholder and Arvey (1984) that no large-scale synthetic validation research had been completed is no longer accurate (actually, another large-scale synthetic validation research project [Peterson, Rosse, & Houston, 1982] was completed some years ago, but is not widely known). Secondly, it appears that the use of appropriately

qualified judges to form prediction equations via synthetic models will lead to prediction equations that are nearly as valid as more traditional transported or generalized equations. Thirdly, for the data analyzed in this project, synthetically developed equations appeared to be nearly as valid as least squares equations developed via a full-blown, criterion-related validation study that uses work sample tests, job knowledge tests, and supervisory ratings as criteria and employs a sufficient sample size (N > 250). These results seem to support and extend work by Schmidt and colleagues (e.g., Schmidt, Hunter, Croll, & McKenzie, 1983) concerning the usefulness of expert judgments in validation research. Fourthly, we did not find large amounts of discriminant, or differential, validity across jobs. However, the relative pattern of discriminant validities was as it should be for the different criterion measures. That is, discriminant validity was greatest when estimated against the Core Technical Proficiency criterion and less when General Soldiering or Overall Performance was used. If differential validity is to be observed, it must come from genuine differences in the core task content which in turn have different ability and skill requirements.

In retrospect, it may be reasonable to expect only a moderate amount of differential validity. First-tour MOS in the Army come from only one sub-population of the occupational hierarchy, entry-level skilled positions, and do not encompass any supervisory, managerial, advanced technical, or formal communication (i.e., writing and speaking) components. Further, the two year first-tour incumbent is still at a relatively early stage on the way to expert performance. Among others, Ackerman (1988) argues that general abilities will be important for a wide range of tasks at these early stages of mastery.

Another issue that needs additional investigation is identified by the lack of correspondence between matching jobs on the basis of their task requirements and matching them on the basis of their prediction equations. Recall from Chapter 4 that the empirically based prediction equation transported from the MOS with the highest "task match" did not always yield validities that were higher, or as high, as prediction equations from other MOS. Why is that? Whatever the reason, it is most likely also the cause of observing basically the same average validities for the general equations as for the average of the MOS or cluster specific equations. If differential task content was a perfect mirror of differential job requirements then by definition the individual MOS or MOS cluster equations would capture more information than a single general equation. The fact that such is not the case implies that the job analytic methods so far developed cannot capture everything that the empirical weights can. They most likely will never be able to do so, because few problems have perfect solutions. However, investigating the reasons for the lack of correspondence in matching task profiles versus matching prediction equations would offer additional clues

about how job analytic methods might be made even more sensitive to differential job requirements.

In summary, for this sub-population of jobs, the synthetic methods are reasonable ways to generate prediction procedures in situations where no empirical validation data are available. Absolute and discriminant prediction accuracy will suffer just a bit because the synthetic methods tend to weight the array of predictors more similarly across jobs than do the empirical estimation procedures. The similarity between the synthetic methods and validity generalization bears further investigation as to why they seem to experience the same slight decrement when compared to job specific empirical validation. It may indeed be for different reasons.

Finally, it seems clear from these results that personnel psychology has learned a great deal about the nature of jobs and the individual differences that forecast future performance on jobs. For many subpopulations of the occupational hierarchy, such as the one considered in this project, expert judges can take advantage of good job analysis information almost as well as empirical regression techniques. While this may not be true for other parts of the occupational spectrum, we are indeed learning.

Setting Performance Standards

Within the Synthetic Validity Project, the investigation of procedures for setting performance standards confronts directly what may be one of the most difficult measurement problems of all. That is, the principal objective was to evaluate alternative methods for scaling individual performance against defined standards. Standards are represented as specific levels of performance that the organization defines to be critical in terms of specific operational outcomes. For the current project, the critical levels were defined in terms of performance that was judged as Unacceptable, Marginal, Acceptable, or Outstanding. The operational meaning of each performance level was discussed in Chapter 5. The principal reason for scaling levels of performance in such operational and measurement-independent terms is to provide a means for setting selection standards (e.g., critical scores on the AFQT).

To the best of our knowledge, the problem of scaling performance standards has never before been addressed in a non-educational setting and has never been examined in the way it was in this project in <u>any</u> job situation. In this regard, the Synthetic Validity Project was in completely uncharted territory and faced a large number of new and complex issues.

Almost all previous work related to performance standards has been in the educational setting and goes under the label of criterion-referenced measurement. In this context, the critical scores are referenced to a specific criterion measure (e.g., certification exams or achievement tests). The current project's

literature review on standard setting (Pulakos et al., 1989) summarized the available methods and their research results.

Professional licensing boards impose standards of a sort when they certify individuals for membership in a profession. However, in this instance it is really the predictor that is being scaled and not professional performance. That is, "passing" the licensing or certification exam is taken as a forecast of successful professional performance. No research study has ever attempted to establish the predictive validity of licensing or certification standards. Finally, for a few jobs in the labor force, industrial engineering or human factors procedures have been used to established standard times for specific job tasks. Such time standards typically do not consider directly the level of performance required. Failure to meet the time standards are seen as problems in motivation, training, or job design.

In summary, the examination of standards in education, professional licensing, or industrial engineering does not deal with the same questions as the current project. The Synthetic Validity Project addressed a much more difficult set of issues. That is, can the available job performance information be used to scale critical levels of job performance itself, such that there would be an organizational consensus as to what constitutes Unacceptable, Marginal, Acceptable, and Outstanding performance? We realized from the start this was a very difficult problem that incorporates both complex scaling issues and very sensitive value judgments. We were not disappointed.

In the present case, we investigated the feasibility of setting performance standards for new and existing jobs without going to the time and expense of developing and administering specific tests. While we tried to link different performance levels to specific consequences (e.g., dismissal, remedial training), judges were aware that the overall goal of these exercises was to set selection test cutoffs and not to carry out the specific consequences described.

Much was learned from this research about the feasibility of specific procedures for scaling standards of performance. For example, it seems necessary that the SMEs fully understand the objectives and the consequences of the standard setting exercise. It seems likely that the frame of reference for the judgments will influence the level of performance designated as the standard. Consequently, there are complex value judgments to be resolved up and down the organizational hierarchy. The consensus achieved among the SMEs in the current project is a major step in that direction, but the consequences of the procedure must be open from the start. Not specifying them completely would only lead to complications later.

As the methods were revised and improved, the scale values themselves proved to be quite reliable across judges and the

small mean differences across type of judges (e.g., NCO vs. Officers) could readily be interpreted in terms of their respective frames of reference. The dominant result was of high consistency across judges. A potential difficulty to guard against is the frame of reference produced by the wide experiences of Army personnel with the Skill Qualification Test (SQT). The stimulus material presented for any standard setting procedure must be clearly and distinguished from the context of the SQT.

The most significant conclusion of the standard setting research was that the different methods that we developed and evaluated led to different results. Very strict standards were set when performance was described in terms of "Percent Go" scores on hands-on task performance tests. As many as half of current incumbents were less than fully acceptable and nearly 30% were unacceptable according to the standards set by the Task-Based method. By contrast, fewer than 40% of current incumbents were less than fully acceptable and only 6% were unacceptable according to the standards set by the Behavioral Incident method. Direct estimates of the percent of incumbents at each performance level, collected in Phase II, fell between these two extremes.

It is likely that much of the difference between the two standard setting approaches was due to properties of the empirical data used to estimate the distribution of incumbent performance levels rather than to the methods themselves. The standard setting judges may not have accounted for a tendency toward leniency in the ratings provided by supervisors and peers in the Project A data. The judges also may not have appreciated the strictness with which the hands-on exercises were scored nor differences from the SQT where soldiers are afforded an opportunity to practice before being tested. Further research is needed to find out more about the cognitive processes of the judges as they were setting standards by each method and to compare their assumptions to the conditions under which the empirical data were collected. For this reason, we are not prepared to reject either method but recommend further work before any method is put to operational use.

Another significant finding was the relative lack of MOS differences in the resulting performance distributions. The Army may very well be successful in designing selection and training systems and job requirements to roughly equate the proportions of Unacceptable, Marginal, Acceptable, and Outstanding performers in each MOS. Further research is needed to explore the extent to which this is the case or whether the standard setting procedures are simply insensitive to differences in performance requirements. For example, with a larger set of stimulus material, it might be possible to use more and less difficult tasks (or behavioral dimensions) and examine the extent to which the judges adjust their standards accordingly. Further research on the generalizability of each method across MOS through

"substitution" of appropriate tasks or behaviors is also essential.

More research also is needed to examine judges' hypotheses about the consequences of their judgments and the effect of these hypotheses on the standards that they set. If judges were setting standards that might actually lead to soldiers being discharged, would they set them differently? Some might argue that anyone not actually discharged must be performing acceptably and that selection test standards should be linked to actual rates of remedial training and discharges rather than to "hypothetical" performance standards not explicitly linked to operational decisions.

The Task-Based method is limited by the set of tasks for which empirical data are available. In further refinement of this method, development and administration of additional har on task tests might be required. Further research might exp the feasibility of providing "scorer training" to the judges before they make MOS-specific substitutions and before they m judgments. Summative methods that examine each item in a test in setting an overall passing score could also be explored as a means of achieving a closer linkage between the empirical data and the standard setting judgments.

The Behavioral Incident method is also limited by the existing pool of behavioral incidents and expansion of this pool might be required before the approach is used operationally. Incidents are needed for additional dimensions and also in the average effectiveness range. Alternative data collection formats might be explored, such as having judges rate the probability of observing each incident for specific soldiers that they judge to be at specific performance levels. This also might increase the correspondence between the standard setting judgments and the empirical data.

The approach to linkage appeared useful as far as it went. Before being used operationally, further checks on assumptions such as linearity and homogeneity of variance should be made. Most importantly, the linkage between test scores and expected performance level is tenable, but cost-benefit analyses are required to determine the expectancy levels that provide optimal tradeoffs between recruiting costs and the costs and benefits of resulting performance levels.

References

Ackerman, P. L. (1988). Determinants of individual differences during skill acquisition: Cognitive abilities and information processing. Journal of Experimental Psychology: General, 117, 288-318.

Balma, M. J. (1959). The concept of synthetic validity. Personnel Psychology, 12, 395-396.

Brennan, R. L. (1983). Elements of generalizability theory. Iowa City, IA: ACT Publications.

Campbell, J. P., McHenry, J. J., & Wise, L. L. (1990). Modeling job performance in a population of jobs. Personnel Psychology, 43, 313-333.

Chia, W. J., Hoffman, R. G., Campbell, J. P., Szenas, P. L., & Crafts, J. L. (1989). Analysis of job components: The development and evaluation of alternative methods. In L. L. Wise, J. M. Arabian, W. J. Chia, & P. L. Szenas (Eds.), 1989 Army synthetic validity project: Report of Phase I results (ARI Technical Report 845). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A219 926)

Claudy, J. (1978). Multiple regression and validity estimation in one sample. Applied Psychological Measurement, 2, 595-607.

Crafts, J. L., Szenas, P. L., Chia, W. J., & Pulakos, E. D. (1988). A review of models and procedures for synthetic validation for entry-level Army jobs (ARI Research Note 88-107). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A205 438)

Fleishman, E. A., & Quaintance, M. K. (1984). Taxonomies of human performance: The description of human tasks. Orlando: Academic Press.

Guion, R. M. (1976). Recruiting, selection, and job placement. In M. D. Dunnette (Ed.), Handbook of industrial and organizational psychology (pp. 777-828). Chicago: Rand-McNally.

Hambleton, R. K. (1978). On the use of cut-off scores with criterion-referenced tests in instructional settings. Journal of Educational Measurement, 15, 277-290.

Hambleton, R. K. (1980). Test score validity and standard-setting methods. In R. A. Berk (Ed.), Criteria-referenced measurement: The state of the art (pp. 80-123). Baltimore, MD: Johns Hopkins University Press.

Lawshe, C. (1952). Employee selection. Personnel Psychology, 5, 31-34.

Lord, F. M., & Novick, M. R. (1968). Statistical theories of mental test scores. Reading, MA: Addison-Wesley.

McHenry, J. J., Hough, L. M., Toquam, J. L., Hanson, M. A., & Ashworth, S. (1990). Project A validity results: The relationship between predictor and criterion domains. Personnel Psychology, 43, 335-354.

Mitchell, T. W., & Klimoski, R. J. (1986). Estimating the validity of cross-validity estimation. Journal of Applied Psychology, 71, 311-317.

Mossholder, K. W., & Arvey, R. D. (1984). Synthetic validity: A conceptual and comparative view. Journal of Applied Psychology, 69, 322-333.

Oppler, S. H., Peterson, N. G., & Wise, L. L. (1990). Formation of job performance prediction equations and evaluation of their validity. In Peterson, N. G., Owens-Kurtz, C. K., Hoffman, R. G., Arabian, J. M., & Whetzel, D. L. (1990). Army Synthetic Validation Project: Report of Phase II results (ARI Technical Report 892). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A226 355)

Owens-Kurtz, C. K., & Peterson, N. G. (1989). Development of an attribute taxonomy and its application in the formation of synthetic validity composites. In L. L. Wise, J. M. Arabian, W. J. Chia, & Szenas, P. L. (Eds.), 1989 Army synthetic validity project: Report of Phase I results (ARI Technical Report 845). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A219 926)

Peterson, N. G., Hough, L. M., Dunnette, M. D., Rosse, R. L., Houston, J. S., Toquam, J. L., & Wing, H. (1990). Project A: Specification of the predictor domain and development of new selection/classification tests. Personnel Psychology, 43, 247-276.

Peterson, N. G., Owens-Kurtz, C., Hoffman, R. G., Arabian, J. M., & Whetzel, D. L. (Eds.). Army Synthetic Validity Project, Report of Phase II Results, Volume I (ARI Technical Report). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Peterson, N. G., Rosse, R. L., & Houston, J. S. (1982). The job effectiveness prediction system technical report #4: Validity analyses (Final report submitted to Life Office Management Association). Minneapolis: Personnel Decisions Research Institute.

Pulakos, E. D., Wise, L. L., Arabian, J. M., Heon, S., & Delaplane, S. K. (1989). A review of procedures for setting job performance standards (ARI Technical Report 840). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Science. (AD A210 717)

Rose, A. M., Czarnolewski, M. Y., Gragg, F. E., Austin, S. H., Ford, P., Doyle, J., & Hagman, J. D. (1984). Acquisition and retention of soldiering skills. Washington, DC: American Institutes for Research.

Rozeboom, W. W. (1978). Estimation of cross-validated multiple correlation: A Clarification. Psychological Bulletin, 85, 1348-1351.

Sadacca, R., Campbell, J. P., White, L. A., & DiFazio, A. S. (1989). Weighting criterion components to develop composite measures of job performance (ARI Technical Report 838). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A210 357)

Schmidt, F. L., & Hunter, J. E. (1981). Employment testing: Old theories and new research findings. American Psychologist, 36, 1128-1137.

Schmidt, F. L., Hunter, J. E., Croll, P. R., & McKenzie, R. C. (1983). Estimation of employment test validities by expert judgment. Journal of Applied Psychology, 68, 590-601.

Shephard, L. (1980). Standard setting issues and methods. Applied Psychological Measurement, 4, 447-467.

Szenas, P. L., & Wise, L. L. (1989). Combing individual standards into an overall standard: Modeling the judgment. process and investigating differences among judges. In L. L. Wise, J. J. Arabian, W. J. Chia, & Szenas, P. L. (Eds.), 1989 Army synthetic validity project: Report of Phase I results (ARI Technical Report 845). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A219 926)

Taylor, H. C., & Russell, J. T. (1939). The relationship of validity coefficients to the practical validity of tests in selection: Discussion and tables. Journal of Applied Psychology, 23, 565-578.

Toquam, J. L., McHenry, J. J., Corpe, V. A., Rose, S. R., Lammlein, S. E., Kemery, E., Borman, W. C., Mendel, R., & Bosshardt, M. (1988). Development and field test of behaviorally anchored rating scales for nine MOS (ARI Technical Report 776). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences. (AD A194 721)

Wilkinson, L. (1988). SYSTAT: The system for statistics. Evanston, IL: SYSTAT, Inc.

Wing, H. M., Peterson, N. G., & Hoffman, R. G. (1984). Expert judgments of predictor-criterion validity relationships. Symposium presented at the 92nd Annual Convention of the American Psychological Association, Toronto, Canada.

Wise, L. L., Peterson, N. G., Rosse, R. R., & Campbell, J. P. (1989). Comparative analyses of empirical and synthetic job performance prediction equations. In L. L. Wise, J. M. Arabian, W. J. Chia, & P. L. Szenas (Eds.), 1989 Army synthetic validity project: Report of Phase I results (ARI Technical Report 845). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A219 926)

Wise, L. L., McHenry, J. J., & Campbell, J. P., (1990). Identifying optimal predictor composites and testing for generalizability across jobs and performance factors. Personnel Psychology, 43, 355-366.

Wise, L. L., Campbell, J. P., McHenry, J. J., & Hanser, L. R. (1986, August). A latent structure model of job performance factors. Paper presented at the 85th American Psychological Association Convention, Washington, DC.

Wise, L. L., Arabian, J. M., Chia, W. J., & Szenas, P. L. (Eds.). (1989). Army Synthetic Validation Project: Report of Phase I Results (ARI Technical Report 845). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences. (AD A219 926)

Young, W. Y., Houston, J. S., Harris, J. H., Hoffman, R. G., & Wise, L. L. (1990). Large-scale predictor validation in Project A: Data collection procedures and data base preparation. Personnel Psychology, 43, 301-311.

Appendix A

Examples of Phase III Instruments

INTRODUCTION TO JOB DESCRIPTION WORKSHOPS

There are two long-range goals for this project: (a) to develop techniques that can be used to identify the specific skills and abilities required to perform successfully in each entry-level MOS in the Army; and (b) to develop procedures for determining the minimum ability requirements for each entry-level MOS. These goals must be reached in order for the Army to take advantage of recent advances in personnel selection research conducted by the Army.

The research that led to these advances began six years ago, when thee Army Research Institute began an investigation of the Armed Services Vocational Aptitude Battery (ASVAB), which all of the Armed Services use to select new recruits and to classify recruits into MOS. The Army was interested in determining how well the ASVAB scores that an applicant obtains when he or she enlists predict on-the-job performance in the Army in the soldier's first tour. The Army also was interested in determining whether new tests, such as temperament tests or psychomotor tests, could be added to the ASVAB so that it would predict job performance even more accurately.

The Army selected 19 MOS for detailed investigation. For each of these MOS, a number of job performance tests were developed. These included hands-on tests, paper-and-pencil job knowledge tests, and performance rating scales. Approximately 500 first-tour soldiers from each MOS completed these performance tests. At the conclusion of testing, scores on the performance tests were compared with soldiers' ASVAB scores to determine how well the ASVAB predicted job performance.

Results showed that the ASVAB did an excellent job of predicting how well soldiers could perform the tasks they had been assigned on their jobs. The results also revealed that the new temperament tests predicted job motivation and personal discipline better than the ASVAB did.

One finding from this investigation was that the Army could improve the selection and classification of new recruits into some MOS by making changes in the ASVAB aptitude area composites. Those changes have now been made. More changes may be made in the days ahead, especially if the Army decides to add new tests to the ASVAB.

The primary limitation of this investigation was that the Army was able to study only 19 MOS in detail. As the Army prepares to make additional changes in the ASVAB and in the way ASVAB is used to select and classify recruits into MOS, it must develop techniques that can be used to identify the specific skills and abilities required to perform successfully in all 269 entry-level MOS in the Army. The Army also must develop procedures for determining the minimum ability requirements for each MOS.

Your Role in Today's Workshop

We have prepared several different rating and judgment procedures that we think NCOs and officers will be able to use to help us identify the skill and ability requirements of first-tour soldiers in their MOS. What we want you to do today is try out some of the procedures we have developed and let us know how easy or difficult you find them. We want you to tell us when instructions are unclear. In short, we want you help in refining the procedures, so that we can obtain ratings and judgments that are as accurate as possible.

DATA REQUIRED BY THE PRIVACY ACT OF 1974
(5 U.S.C. 552a)

TITLE OF FORM	PRESCRIBING DIRECTIVE
	AR 70-1

1. AUTHORITY

10 USC Sec 4503

2. PRINCIPAL PURPOSE(S)

The data collected are to be used for research purposes only.

3. ROUTINE USES

This is an experimental personnel data collection activity conducted by the U. S. Army Research Institute for the Behavioral and Social Sciences persuant to its research mission as prescribed in AR 70-1. When identifiers (name or Social Security Number) are requested they are to be used for administrative and statistical control purposes only. Full confidentiality of the responses will be maintained in the processing of these data.

4. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION

Although your participation in this research is voluntary, we encourage you to provide complete and accurate information in the interests of the research. There will be no effect on you for not providing all or any part of the information. This notice may be detached from the rest of the form and retained by you if so desired.

FORM Privacy Act Statement - 26 Sep 75

DA Form 4368-R, 1 May 75

BACKGROUND INFORMATION

1. Name: ____
   Last   First   MI

2. SSN: ________________________

3. Date: ________________________
   Day   Month   Year

4. Post: ____________________________________

5. Unit: ____________________________________

6. Your Position or Job Title: ______________________________
   (Include your MOS code if you are a soldier.)

7. Sex:
   - ☐ Male
   - ☐ Female

8. Race:
   - ☐ Black/Afro-American
   - ☐ American Indian
   - ☐ Hispanic
   - ☐ White
   - ☐ Other

9. Please enter your current pay grade (for example E6, W2, 02, or GS-9): ______

10. Time in the Army (including time in service and, for civilians, time working for the Army as a civilian): ____ years ____ months

11. MOS you are rating (circle one):

    12B 13B 27E 29E 31C 31D 31F 51B 54B 55B 95B 96B

12. Experience with MOS you are rating: ____ years ____ months

    Experience includes time spent working in or supervising persons in the MOS, training persons for the MOS, reviewing and revising doctrine or training and testing programs for the MOS.

PERFORMANCE AREA DEFINITIONS

Below are definitions of three performance areas. Read them carefully.

CORE TECHNICAL AREA: This performance area is made up of the tasks that are "central" to the MOS. The tasks represent the core of the job and are the primary definers of the MOS.

GENERAL SOLDIERING AREA: In addition to the core technical area, individuals in every MOS are responsible for being able to perform a variety of general soldiering tasks. These are referred to as "Common Tasks." General Soldiering Area refers to all Common Tasks.

OVERALL PERFORMANCE: This refers to all areas of job performance, including the two areas listed above. Think of this as total job performance.

ARMY TASK QUESTIONNAIRE

This questionnaire contains 96 tasks designed to cover ALL ENTRY-LEVEL MOS in the Army. Since it is designed to cover so many MOS, a large number of these tasks may not apply to the particular MOS you are rating.

For each task, we would like you to make five ratings. First, indicate how FREQUENTLY each task is performed by soldiers in this MOS, using the following FREQUENCY rating scale:

0 = Never; this task is not part of the job.
1 = Least Often; this task is performed much less often than most other tasks.
2 = Not Very Often; this task is performed less often than most other tasks.
3 = Often; this task is performed about as often as other tasks.
4 = Very Often; this task is performed more often than most other tasks.
5 = Most Often; this task is performed much more often than most other tasks.

As you make your ratings, think about soldiers who have about 24 months of service in this MOS after Basic and AIT. Also keep in mind all that you know about the full range of duty assignments for this MOS.

After you have made FREQUENCY ratings for all 96 tasks, go through the list again, this time rating the IMPORTANCE of each task for successful performance in three different areas of the job: Core Technical Area, General Soldiering Area, and Overall Performance. The definitions of these performance areas are on a separate sheet, entitled PERFORMANCE AREA DEFINITIONS. Please read these definitions carefully before making your IMPORTANCE ratings.

You will make IMPORTANCE ratings using the following rating scale:

0 = No Importance
1 = Extremely Low Importance
2 = Low Importance
3 = Moderate Importance
4 = High Importance
5 = Extremely High Importance

In addition to the IMPORTANCE ratings, we would like you to make a single DIFFICULTY rating for each task, using the following scale:

How difficult is it to reach and maintain an acceptable level of proficiency in this task?

1 = Very Easy; this task can be performed correctly after less than an hour of instruction, and performed again correctly a year later with little or no practice in between.
2 = Somewhat Easy
3 = Neither Easy Nor Difficult; this task can be performed correctly after a few days of instruction, and performed again correctly a few months later with little or no practice in between.
4 = Somewhat Difficult
5 = Very Difficult; this task can be performed correctly after several weeks of instruction, and performed again correctly only if it is practiced regularly.

Note: If you decided that a particular task is not part of this MOS (so you gave it a FREQUENCY rating of 0), you should leave all three IMPORTANCE ratings and the DIFFICULTY rating blank.

Please look at the EXAMPLES below and read through their explanations before starting to make your ratings.

EXAMPLES:

FREQUENCY	IMPORTANCE	DIFFICULTY
0 = Never 1 = Least Often 2 = Not Very Often 3 = Often 4 = Very Often 5 = Most Often	0 = No Importance 1 = Extremely Low Importance 2 = Low Importance 3 = Moderate Importance 4 = High Importance 5 = Extremely High Importance	1 = Very Easy 2 = Somewhat Easy 3 = Neither Easy Nor Difficult 4 = Somewhat Difficult 5 = Very Difficult

Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
A. 0	***Perform Medical Laboratory Procedures:*** Conduct various types of blood tests, urinalysis, cultures, etc.	___	___	___	___
B. 1	***Perform Operator Checks and Services on Weapons:*** Check, disassemble, assemble, clean, lubricate, and adjust weapons, including pistols, rifles, machine guns, hand grenades, and breechblocks.	2	4	4	4

Joe supervises 94B (Cooks). He went through the list of tasks and made FREQUENCY ratings for each one.

1. Since he felt that Task A, "Perform Medical Laboratory Procedures," was not part of the job for 94B, he gave this task a FREQUENCY rating of 0, and left all three IMPORTANCE ratings and the DIFFICULTY rating blank.

2. Joe felt that Task B, "Perform Operator Checks and Services on Weapons," was performed much less often than most tasks in MOS 94B, so he gave it a FREQUENCY rating of 1, for Least Often.

Joe then returned to the beginning of the list and, after carefully reading the PERFORMANCE AREA DEFINITIONS, has started making his ratings of how IMPORTANT each task is for successful performance in three different areas of the job.

Joe decided that this task was of Low Importance for Core Technical Area, so he gave it an IMPORTANCE rating of 2.

For General Soldiering, Joe felt that this task was of High Importance, so he gave it an IMPORTANCE rating of 4 for this performance area.

For Overall Performance, Joe gave this task a rating of 4, indicating the task was of High Importance for overall job performance.

Finally, Joe gave Task B a DIFFICULTY rating of 4, indicating that it is somewhat Difficult for most soldiers to reach and maintain an acceptable level of proficiency on this task.

Keep the PERFORMANCE AREA DEFINITIONS handy and refer to them as often as necessary while making your IMPORTANCE ratings.

Note: Many of the task definitions in this questionnaire contain specific examples to help explain and clarify the task. Please keep in mind that these are just some of the possible examples; it was not practical to list every possible example.

Name: ____________________

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I. Maintenance

A. Mechanical Systems Maintenance

Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
1. ___	***Perform Operator Maintenance Checks and Services***: Follow directions in Operator's Manual; conduct before, during, after, and weekly operator checks and services on vehicles, trailers, generators, construction equipment, or other kinds of mechanical apparatus.	___	___	___	___
2. ___	***Perform Operator Checks and Services on Weapons***: Check, disassemble, assemble, clean, lubricate, and adjust weapons, including pistols, rifles, machine guns, hand grenades, and breechblocks.	___	___	___	___
3. ___	***Troubleshoot Mechanical Systems***: Measure, use specialized test equipment and manuals, and observe mechanical equipment (for example, engines, transmissions, brakes, hydraulics, refrigeration systems, etc.) to detect and diagnose problems and malfunctions.	___	___	___	___
4. ___	***Repair Weapons***: After the cause of a problem in a weapon has been found, fix it using the appropriate tools and necessary replacement parts by following directions in the weapon's technical manual.	___	___	___	___
5. ___	***Repair Mechanical Systems***: After the cause of a problem in a mechanical part has been found, fix it using the appropriate tools (for example, wrenches, screwdrivers, gauges, hammers, soldering equipment, etc.) and necessary replacement parts by following directions in the equipment's technical manual.	___	___	___	___
6. ___	***Troubleshoot Weapons***: Find the cause of malfunctions in weapons using technical manuals, tools, and test equipment.	___	___	___	___

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B. Electrical and Electronic Systems Maintenance

Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
7. ____	***Install Electronic Components***: Connect electronic and communications equipment (for example, radios, antennas, telephones, teletypewriters, radar, power supplies, etc.) and check system for operation.	____	____	____	____
8. ____	***Inspect Electrical Systems***: Measure, use specialized test equipment and manuals, and observe electrical systems (for example, generators, wiring harnesses, switches, relays, circuit breakers, etc.) to detect and diagnose problems and malfunctions.	____	____	____	____
9. ____	***Inspect Electronic Systems***: Measure, use specialized test equipment and manuals, and observe electronic systems (for example, communications equipment, radar, missile and tank ballistics computer, etc) to detect and diagnose problems and malfunctions.	____	____	____	____
10. ____	***Repair Electrical Systems***: After the cause of an electrical problem has been found, fix it with the appropriate tools (for example, wire strippers, pliers, soldering irons, etc.) and necessary replacement parts by following directions in the equipment's technical manual.	____	____	____	____
11. ____	***Repair Electronic Components***: After the cause of an electronics problem has been found, fix it with the appropriate tools (for example, test sets, screwdrivers, pliers, soldering guns, etc.) and necessary replacement parts by following directions in the equipment's technical manual.	____	____	____	____

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II. General Operations

	Core Technical	General Soldiering	Overall Performance	Difficulty

C. Pack and Load

12. ____ ***Pack and Load Materials***: Load and lash materials onto transport vehicles (land, sea, or air) to secure and protect from damage or loss during shipment. ____ ____ ____ ____

13. ____ ***Prepare Parachutes***: Inspect cargo and personnel parachutes, repair or replace faulty components, and pack parachutes for air drop. ____ ____ ____ ____

14. ____ ***Prepare Equipment and Supplies for Air Drop***: Build or assemble platforms, cushions, and riggings for parachuting supplies, equipment, and vehicles. ____ ____ ____ ____

D. Vehicle and Equipment Operations

15. ____ ***Operate Power Excavating Equipment***: Use air hammers and drills, paving breakers, grinders, backfill tampers, or other hand-operated power equipment in building concrete, stone, or other structures (for example, roads, fortifications, buildings, etc.). ____ ____ ____ ____

16. ____ ***Operate Wheeled Vehicles***: Drive wheeled vehicles over roads and cross-country in response to mission, terrain, and traffic regulations. ____ ____ ____ ____

17. ____ ***Operate Track Vehicles***: Drive track vehicles (for example, tank, APC, BFV, etc.) in response to mission, terrain, and traffic controls. ____ ____ ____ ____

18. ____ ***Operate Boats***: Drive boats and rafts. ____ ____ ____ ____

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
19. ___	***Operate Lifting, Loading, and Grading Equipment***: Operate fork lifts, cranes, back-hoes, graders, and other heavy equipment to load, unload, or move heavy equipment, supplies, construction materials (for example, culvert pipe, building and bridge parts), or terrain (for example, earth, rocks, trees, etc.).	___	___	___	___
	E. Construct/Assemble				
20. ___	***Paint***: Prepare surfaces (clean, remove old paint, sand) and apply paint with brush, roller, or spray.	___	___	___	___
21. ___	***Install Wire and Cables***: String or lay, and connect electrical wire or communications cables.	___	___	___	___
22. ___	***Repair Plastic and Fiberglass***: Fix plastic or fiberglass parts and structures by cutting, sawing, drilling, sanding, filling, gluing, and painting.	___	___	___	___
23. ___	***Repair Metal***: Fix metal structures or parts by bending, cutting, drilling, welding, hammering, grinding, soldering, and painting.	___	___	___	___
24. ___	***Assemble Steel Structures***: Erect bridges, antennas, and other steel structures. May require the assistance of others and use of heavy equipment.	___	___	___	___
25. ___	***Install Pipe Assemblies***: Place, connect, and test pipe assemblies and fixtures (for example, plumbing, POL pipelines and pumps, etc.).	___	___	___	___

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Item	Core Technical	General Soldiering	Overall Performance	Difficulty
26. ___ ***Construct Wooden Buildings and Other Structures***: Measure, saw, nail or plane to frame, sheathe, and roof buildings, or erect trestles, bridges, and piers.	___	___	___	___
27. ___ ***Construct Masonry Buildings and Structures***: Measure, lay brick or concrete blocks, or build forms and pour concrete to construct walls, columns, field fortifications, and other concrete or masonry structures.	___	___	___	___
F. Technical Procedures				
28. ___ ***Operate Gas and Electric Powered Equipment***: Operate electric generators, air compressors, smoke generators, quarry machines, mobile washing machines, water pumps, etc., to produce power or process materials.	___	___	___	___
29. ___ ***Select, Lay Out, and Clean Medical or Dental Equipment and Supplies***: Prepare treatment areas for use by following prescribed procedures for laying out instruments and equipment; clean equipment and area for future use.	___	___	___	___
30. ___ ***Use Audiovisual Equipment***: Use cameras and videotape to record sights and sounds for intelligence analysis, training, or documentation.	___	___	___	___
31. ___ ***Reproduce Printed Material***: Operate duplicating machines, offset presses, and similar equipment to reproduce printed materials; collate and bind materials using various types of bindery equipment.	___	___	___	___

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	Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
32.	___	***Operate Electronic Equipment***: Set and adjust the controls to operate electronic equipment (for example, radio, computer hardware, missile ballistics controls, etc.).	___	___	___	___
33.	___	***Operate Radar***: Operate radar equipment and interpret signals.	___	___	___	___
34.	___	***Operate Computer Hardware***: Operate computer hardware such as tape and disk drives, optical scanners, terminals, and other input/output devices. (Does not include programming).	___	___	___	___
35.	___	***Cook***: Prepare food and beverages according to recipes and meal plans (measure, mix, bake, etc.); inspect fresh food and staples for freshness; clean equipment and work area.	___	___	___	___
36.	___	***Perform Medical Laboratory Procedures***: Conduct various types of blood tests, urinalysis, cultures, etc.	___	___	___	___
37.	___	***Conduct Land Surveys***: Survey terrain to determine elevations, azimuths, and distances of terrain features; record information.	___	___	___	___
38.	___	***Provide Medical or Dental Treatment***: Give medical attention to soldiers in the field or in medical or dental clinics, or give veterinary treatment to animals (for example, administer injections, take blood pressure, change sterile dressings, etc.); does not include first aid.	___	___	___	___

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
	G. Make Technical Drawings				
39. ___	***Sketch Maps, Overlays, or Range Cards:*** Use standard symbols to make sketches of terrain, including locations of buildings and other objects, targets, avenues of approach, and maneuver areas.	___	___	___	___
40. ___	***Produce Technical Drawings:*** Use drafting and drawing equipment to make technical drawings and blueprints.	___	___	___	___
41. ___	***Draw Maps and Overlays:*** Use drafting, graphics, and related techniques to draw and revise maps from aerial photographs.	___	___	___	___
42. ___	***Draw Illustrations:*** Use pen, pencil, paint, or other media to make free-hand technical drawings and illustrations. (Does not include range cards, sketched maps or other field expedient drawings).	___	___	___	___
	III. Administrative				
	H. Clerical				
43. ___	***Type:*** Type information using a typewriter, teletypewriter, keypunch, or computer terminal.	___	___	___	___
44. ___	***Prepare Technical Forms and Documents:*** Follow standardized procedures to prepare or complete forms and documents (for example, personnel records, legal briefs, requisition requests, inspection records, etc.).	___	___	___	___

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
45. ___	***Record, File, and Dispatch Information***: Collect, copy, update, sort, index, file, and retrieve information (for example, mail, training rosters, personnel statistics, supply inventories, etc.).	___	___	___	___
46. ___	***Receive, Store, and Issue Supplies, Equipment, and Other Materials***: Inspect materials and review paperwork when receiving materials; sort, transport, and store materials; issue or ship materials to authorized personnel or units.	___	___	___	___
	I. Communication				
47. ___	***Use Hand and Arm Signals***: Communicate messages and instructions using hand and arm signals.	___	___	___	___
48. ___	***Read Technical Manuals, Field Manuals, Regulations, and Other Publications***: Use index and table of contents to find location of needed information; locate information; read instructions, diagrams, charts, and tables.	___	___	___	___
49. ___	***Use Maps***: Read and interpret map symbols and identify terrain features in order to orient map to your position in the field; determine grid coordinates; determine directions; identify roads, towns, etc.	___	___	___	___
50. ___	***Send and Receive Radio Messages***: Use standardized radio codes and procedures to transmit and receive messages and other information.	___	___	___	___

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
51. ___	***Give Short Oral Reports***: Use standard communication procedures to organize and deliver information (for example, SALUTE, call for and adjust indirect fire, status reports, etc.).	___	___	___	___
52. ___	***Receive Clients, Patients, Guests***: Schedule, greet, and give routine information to persons seeking medical, dental, legal, or counseling services.	___	___	___	___
53. ___	***Give Directions and Instructions***: Give verbal information, instructions, or directions to others.	___	___	___	___
54. ___	***Write and Deliver Presentations***: Make formal presentations (for example, briefings, radio and television broadcasts, etc.).	___	___	___	___
55. ___	***Interview***: Gather information from clients, patients, witnesses, prisoners, or other persons.	___	___	___	___
56. ___	***Provide Counseling and Other Interpersonal Interventions***: Conduct personal adjustment counseling with individuals and groups; use interpersonal relations skills to solve relationship problems.	___	___	___	___
57. ___	***Write Documents and Correspondence***: Draft letters, reports, memos, etc.; proofread and edit.	___	___	___	___

J. Analyze Information

Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
58. ___	***Decode Data***: Use coding systems and rules to decipher and interpret coded information (for example, use CEOI, interpret symbols/signs, etc.).	___	___	___	___

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		Core Technical	General Soldiering	Overall Performance	
59. ___	***Analyze Electronic Signals***: Analyze electronic signals to detect threat transmitters and electronic countermeasures.	___	___	___	___
60. ___	***Analyze Weather Conditions***: Determine weather conditions and analyze their effects on tactical operations.	___	___	___	___
61. ___	***Order Equipment and Supplies***: Determine needs and requisition needed supplies, materials, and equipment.	___	___	___	___
62. ___	***Estimate Time and Cost of Maintenance Operations***: Estimate equipment downtime and cost of repairs, including parts and labor.	___	___	___	___
63. ___	***Plan Placement or Use of Tactical Equipment***: Using maps and on-site inspection, identify positions and areas to be used for cover and concealment and to place weapons, fortifications, mines, and detectors.	___	___	___	___
64. ___	***Translate Foreign Languages***: Translate written or spoken foreign language communications.	___	___	___	___
65. ___	***Analyze Intelligence Data***: Determine importance and reliability of information; use information to determine identity, capabilities, disposition, and movement of enemy forces.	___	___	___	___

K. Applied Math and Data Processing

66. ___	***Control Money***: Keep accounting records; disperse and collect money and money orders.	___	___	___	___

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
67. ____	***Determine Firing Data for Indirect Fire Weapons***: Use maps, firing charts, and targeting and ballistics information to determine elevation and azimuth needed for engaging targets.	____	____	____	____
68. ____	***Compute Statistics or Other Mathematical Calculations***: Select formulas and make mathematical calculations, with or without using calculators or computers; report results.	____	____	____	____
69. ____	***Provide Programming and Data Processing Support for Computer Operations***: Analyze data processing needs; select or prepare, edit, test, and run computer programs; document process and results.	____	____	____	____

L. Control Air Traffic

Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
70. ____	***Control Air Traffic***: Coordinate departing, en route, arriving, and holding aircraft by monitoring radar equipment, communicating with aircraft and other air traffic control units.	____	____	____	____

IV. Combat

M. Individual Combat

Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
71. ____	***Use Hand Grenades***: Identify, inspect, arm, throw, and secure hand grenades.	____	____	____	____
72. ____	***Protect Against NBC Hazards***: Use protective clothing, masks, and decontamination equipment to protect self, others, equipment, and supplies from nuclear, biological, and chemical hazards.	____	____	____	____

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	Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
73.	____	***Handle Demolitions or Mines***: Store, place, charge, discharge, and disarm explosives, demolition devices, or mines.	____	____	____	____
74.	____	***Engage in Hand-to-Hand Combat***: Use offensive and defensive maneuvers to overcome hostile individuals.	____	____	____	____
75.	____	***Fire Individual Weapons***: Aim, track, and fire individual weapons, such as rifles, pistols, machine guns, and LAW, at designated targets; load, reduce a stoppage, and clear weapons.	____	____	____	____
76.	____	***Control Individuals and Crowds***: Perform guard duty, including challenge and password; apprehend and search suspected criminals or enemy soldiers; guard prisoners; participate in riot control.	____	____	____	____
77.	____	***Customs and Laws of War***: Use knowledge of Geneva convention and military SOP concerning treatment of enemy personnel, engagement of the enemy, conduct of military protocol and ceremony, guard duty, and physical readiness.	____	____	____	____
78.	____	***Navigate***: During the day or night, with or without a map, locate positions and move from point to point in response to terrain features (for example, for cover or concealment), battle conditions, and mission.	____	____	____	____
79.	____	***Survive in the Field***: Select, prepare, and occupy individual tactical positions (for example, battle positions, overwatch positions, observation posts), camouflage self and equipment, observe security procedures.	____	____	____	____

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
80. ___	***Move and React in the Field*:** Move on foot in the battlefield as a member of a tactical operation; react to threats, including direct and indirect fire.	___	___	___	___
	N. Crew-Served Weapons				
81. ___	***Load and Unload Field Artillery or Tank Guns*:** Operate breech controls and handle ammunition (stow and load) to prepare guns for firing; unload or extract unused rounds or misfires.	___	___	___	___
82. ___	***Fire Heavy Direct Fire Weapons (for example, tank main guns, TOW missile, IFV cannon, etc.)*:** Using weapon sights, manipulate weapon controls to aim, track, and fire on targets.	___	___	___	___
83. ___	***Prepare Heavy Weapons for Tactical Use*:** Position and prepare for firing heavy tactical weapons, such as missiles, field artillery, and anti-aircraft systems.	___	___	___	___
84. ___	***Place and Camouflage Tactical Equipment and Materials in the Field*:** Place mines, detectors, chemicals, and camouflage materials into position in the battlefield.	___	___	___	___
85. ___	***Fire Indirect Fire Weapons (for example, field artillery and heavy mortars)*:** Lay weapon by adjusting azimuth and elevation controls in response to fire commands.	___	___	___	___

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Frequency	Item	Core Technical	General Soldiering	Overall Performance	Difficulty
	O. Give First Aid				
86. ___	***Give First Aid:*** Carry out first aid procedures (for example, CPR, put on field dressing, prevent shock, etc.).	___	___	___	___
	P. Identify Targets				
87. ___	***Detect and Identify Targets:*** With or without optical devices (for example, night sights, weapon sights, binoculars, etc.), locate possible targets, and identify type (for example, troops, tanks, aircraft, etc.) and nomenclature.	___	___	___	___
	Q. Supervision				
88. ___	***Plan Operations:*** Plan, prepare, and develop orders for team operations, including combat, support, and technical operations.	___	___	___	___
89. ___	***Direct/Lead Teams:*** Direct combat and security team activities in the field (for example, lead reconnaissance teams, set up offensive and defensive positions, carry out a fire mission, etc.).	___	___	___	___
90. ___	***Monitor/Inspect:*** Monitor subordinates to ensure that they are carrying out their duties properly, that they have the correct equipment, that supply levels are adequate for the mission, and that records are complete, etc.).	___	___	___	___
91. ___	***Lead:*** Influence subordinates by setting goals, maintaining good lines of communication, sharing hardships, building trusts, etc.	___	___	___	___

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Frequency	Task	Core Technical	General Soldiering	Overall Performance	Difficulty
92. ____	***Act As A Model:*** Show subordinates correct way to perform technical tasks, maintain a positive attitude under adverse conditions, demonstrate proper military bearing, etc., on a day-to-day basis.	____	____	____	____
93. ____	***Counsel:*** Provide individual subordinates with support, assistance, and feedback on specific performance, personal, or disciplinary problems.	____	____	____	____
94. ____	***Communicate:*** Compose orders, brief subordinates on things that are happening in the unit; keep superiors and peers informed, etc.	____	____	____	____
95. ____	***Train:*** Schedule, plan, and conduct training for subordinates.	____	____	____	____
96. ____	***Personnel Administration:*** Prepare and conduct performance appraisals, recommend various personnel actions, keep and maintain personnel and administrative records, etc.	____	____	____	____

What percentage of the MOS you are rating is covered by these task categories? (Circle the best response.)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

If you answered less than 100%, what task categories should be added?

Standard Setting Exercises
Performance Level Definitions

We have designed two exercises to set job performance standards. In each exercise, we would like you to help us set standards for job performance that will allow us to determine whether a soldier's performance is Unacceptable, Marginal, Acceptable, or Outstanding.

Unacceptable: Soldiers who **consistently** perform like this should not have been selected for this MOS. Their performance is hurting the Army. Additional training would not bring their performance up to acceptable levels.

Marginal: Soldiers who **consistently** perform like this need extra or remedial training. Their current performance is of little or no benefit to the Army.

Acceptable: Soldiers who **consistently** perform like this are doing an adequate job. They are making positive contributions to the Army.

Outstanding: Soldiers who **consistently** perform like this are doing extremely well. They are making exceptional contributions to the Army and are good examples to other soldiers.

Keep these definitions handy as you complete the following questionnaires. Please refer back to them from time to time.

Name:______________________________

Behavioral Incident Standard Setting Questionnaire

12B - COMBAT ENGINEER

In this section of the workshop we would like you to help us set job performance standards on two or three broad performance areas that apply to the MOS that you are rating. For each area, twenty behavioral incidents, or examples of performance, have been provided by other SMEs as samples of the types of behaviors that fit each area. These examples come from a number of different MOS and they vary in level of effectiveness. Thus, some incidents illustrate poor performance and some illustrate good performance, but they all illustrate performance within a particular type of job behavior.

For each area, read the definition and think of similar types of tasks that are performed in the MOS that you are rating. Then for each behavioral incident ask yourself the following question:

> If a soldier CONSISTENTLY performed duties in this area at a level of effectiveness like the example incident, what kind of soldier would this be?

Refer to the one-page handout containing the definitions of Unacceptable, Marginal, Acceptable, and Outstanding performance to guide you as you make your ratings. Make your ratings by thinking of similar types of incidents for your MOS. Circle the letter that matches that level of effectiveness of incident. If any incident is so unfamiliar that you cannot decide what level of performance effectiveness it represents, than circle CNR for "cannot rate." Please make sure that you circle only one response for each example.

<u>Remember:</u> As you make your ratings, think about soldiers who have about 24 months of service in this MOS after Basic and AIT. Also keep in mind all that you know about the full range of duty assignments for this MOS.

Example:

<u>Demonstrate Leadership</u> -- Demonstrate leadership and maturity. Act as a model, give direction and instruction to peers; support peers and/or provide informal counseling; and promote a positive public image of the military.

1. This soldier spent many duty and non-duty hours learning his new MOS. In a few months, he was tops in his MOS and was selected as the first E-4 to evaluate other soldiers in the MOS. U M A O CNR

The rater read the definition of Demonstrate Leadership and the example and decided that a soldier who consistently performed like this example would be demonstrating outstanding leadership. Therefore, the rater circled the "O" for Outstanding.

D. Vehicle and Equipment Operations – Drive or operate heavy mechanical equipment.

U - Unacceptable
M - Marginal
A - Acceptable
O - Outstanding
CNR - Cannot Rate

1.	While this soldier was driving an 8 ton goer up a hill, the transmission locked. When the soldier tried to force it by stepping on the gas pedal, the engine blew up.	U M A O CNR
2.	As the driver of an M60A1 on a road march, this soldier maintained the proper interval between his vehicle and the one in front of his, and also maneuvered properly through different types of terrain.	U M A O CNR
3.	While driving an M915 hauling hazardous cargo, this soldier drove the truck through a tunnel.	U M A O CNR
4.	During a tactical road march on an ARTEP, this soldier's tank came under enemy fire. He quickly and successfully maneuvered the tank to a safe location using proper terrain features.	U M A O CNR
5.	This soldier overloaded the hoist capacity and was reckless when the load was in the air. His actions resulted in the injury of one man and damage to the vehicle and the hoist.	U M A O CNR
6.	While driving the tank to the wash rack, this soldier failed to use a ground guide. He hit a car and a fence while he was backing up.	U M A O CNR
7.	While driving a tractor and 5000 gallon tanker on an icy road, the tanker started to jack knife. The soldier carefully steered the vehicle and got control of the tanker before crashing.	U M A O CNR
8.	This soldier failed to use a rear ground guide when backing up the tank. He smashed into another tank, damaging both tanks.	U M A O CNR
9.	While delivering cargo to soldiers in the field at night, this soldier's vehicle got stuck. This soldier used the self recovery system to free the vehicle.	U M A O CNR
10.	This soldier did not hook up the lifting shackles correctly when using a wrecker to recover a jeep. When he pulled away with the wrecker, the jeep tore loose.	U M A O CNR
11.	This soldier was given a badge for driving 2 years without an accident.	U M A O CNR
12.	This soldier, while driving a howitzer, exceeded the safe speed and pivoted the gun too sharply. He hit a sidewalk, causing damage to personal property as well as the gun.	U M A O CNR
13.	This soldier was assigned to recover a 2 1/2 ton. When he arrived at the disabled vehicle, he hooked up the tow bar, made the proper connections, rigged a safety chain between the inside of the bumper and the hoist hook, and raised the vehicle off of its front wheels. The 2 1/2 ton was successfully towed back to the shop.	U M A O CNR
14.	While driving a 1/4 ton vehicle on commitment, this soldier started off in second gear.	U M A O CNR

D. **Vehicle and Equipment Operations** -- Drive or operate heavy mechanical equipment.

U - Unacceptable
M - Marginal
A - Acceptable
O - Outstanding
CNR - Cannot Rate

15.	While driving his tank during a field training exercise, this soldier always looked for the best route to travel and the best battle positions to park the tank.	U M A O CNR
16.	This soldier was sent to recover a 1 1/4 ton that had gone over on its side on a hill. He rigged the vehicle incorrectly before pulling it, causing about $500.00 more damage than the accident had caused.	U M A O CNR
17.	This soldier was driving too fast in a night convoy and hit the vehicle ahead of him/her when he/she rounded a curve and found the convoy had stopped.	U M A O CNR
18.	While driving across an open field, this soldier drove into a swamp and then shifted gears. As a result, his tank became stuck in the swamp and had to be pulled out.	U M A O CNR
19.	This soldier used the proper passive defense procedures when he/she encountered sniper fire.	U M A O CNR
20.	This soldier failed to move his howitzer into position. This resulted in a delay for the entire section.	U M A O CNR

M. <u>Individual Combat</u> -- Engage in combat and survival skills; know customs and laws of war.

U - Unacceptable
M - Marginal
A - Acceptable
O - Outstanding
CNR - Cannot Rate

1.	When assigned to be flank security for his squad, this soldier moved back into the formation when the vegetation became too thick and moved back out when it thinned.	U	M	A	O	CNR
2.	This soldier failed to lower his head while a Claymore mine was fired. He was injured by the back blast.	U	M	A	O	CNR
3.	This soldier was assigned to escort a new prisoner to his cell in the confinement facility. The prisoner had cooperated fully with all of the other soldiers and authorities at the confinement facility. However, this soldier verbally abused and criticized the new prisoner, even though the prisoner was being cooperative.	U	M	A	O	CNR
4.	This soldier's unit was pinned down by an automatic weapon position. This soldier jumped up and threw a grenade, destroying the enemy position. But the soldier was killed, too.	U	M	A	O	CNR
5.	This soldier got lost during a land navigation exercise. A search party found him several klicks away from his destination.	U	M	A	O	CNR
6.	After finding a soldier who had been exposed to a nerve agent, this soldier first put on his protective mask, and administered the antidote to himself. He then masked the casualty, administered the antidote to the patient and called for further medical assistance.	U	M	A	O	CNR
7.	This soldier was instructed not to chamber a round into his M16, but did so anyway. Later, while on patrol, he was surprised by another soldier. This soldier automatically fired, seriously injuring the other soldier.	U	M	A	O	CNR
8.	During a field exercise, this soldier failed to perform his assigned duties of constructing a fighting position, establishing a listening post and installing a telephone.	U	M	A	O	CNR
9.	While performing field duties at a dismount point, this soldier failed to use a sign/countersign challenge when an individual entered the company area.	U	M	A	O	CNR
10.	During this soldier's tour of guard duty, the field officer of the day and the officer of the guard approached. This soldier aggressively challenged them and displayed thorough knowledge of his responsibilities. As a result, the company was helped in achieving outstanding ratings.	U	M	A	O	CNR
11.	Although he was inexperienced in the handling of explosives, this soldier claimed he had worked with TNT. He accidentally set off the TNT, however, killing himself and an NCOIC.	U	M	A	O	CNR
12.	Because this soldier did not know how to disassemble his .45 caliber pistol, another soldier had to help him do it.	U	M	A	O	CNR
13.	This soldier was assigned the task of constructing a machinegun emplacement on the perimeter. He constructed the position using good concealment and cover. He then properly filled out his range card with the correct fields of fire and final protective line.	U	M	A	O	CNR

M. <u>Individual Combat</u> – Engage in combat and survival skills; know customs and laws of war.

U - Unacceptable
M - Marginal
A - Acceptable
O - Outstanding
CNR - Cannot Rate

14.	On an FTX this soldier, who was serving as the compass man, took the patrol on a pre-planned route to the objective rallying point. This soldier also successfully guided the patrol back to the point of origin.	U	M	A	O	CNR
15.	Even with the instructions right in front of him, this soldier could not decontaminate his skin with the decontamination kit.	U	M	A	O	CNR
16.	This soldier searched a POW in a field environment. The soldier failed to search the subject below the waist. Consequently, the POW pulled out a knife and killed the soldier.	U	M	A	O	CNR
17.	This soldier was not using his bayonet-rifle aggressively during training and probably would have lost a confrontation with an opponent.	U	M	A	O	CNR
18.	When this soldier, who was point man on a reconnaissance patrol, noticed a shack to the front, he got the attention of the leader before the patrol walked into a suspected enemy position.	U	M	A	O	CNR
19.	This soldier observed a prisoner attempting to escape over a fence. The soldier ordered the prisoner to halt and was able to apprehend the prisoner without firing any shots.	U	M	A	O	CNR
20.	Even with hours of practice this soldier was unable to throw a grenade through a window from more than 10' away.	U	M	A	O	CNR

Task-Based Standard Setting Exercise
Instructions and EXAMPLE

In this exercise, we would like you to help us set standards for performance in two or three fairly general areas. These areas could apply to more than one MOS; some examples are Individual Combat, Vehicle and Equipment Operation, and Communication.

There are two major steps that will be completed for each task area. The first step involves group participation, while the second step is completed individually. Refer to the EXAMPLE on the next page as you read through the steps below.

Step 1. Read the Task Area Definition and the Sample Tasks listed there. Under the "Yes/No" column, circle "Y" if you think the Sample Task is performed in the MOS you are rating; circle "N" if you think it is not peformed in this MOS. If you circle "N," try to think of a task that is performed in this MOS that is similar to the Sample Task in terms of the type of operations or steps involved, the kinds of skills required, and the degree of difficulty in performing the task. However, do not write your "substitute" task down yet.

After everyone has completed this part of the step, we will discuss possible substitute tasks (or the group may decide that the Sample Task really does occur). After this discussion, a consensus will be reached about the best substitute tasks, and these will be written on the appropriate lines.

Look at the EXAMPLE. A group of 63B agreed that "Replace transmission rotor hub assembly" was not performed in their MOS, and they reached a consensus, after discussion, that "Replace hydrovac in a 5-Ton" was similar in terms of operations performed, skills required, and degree of difficulty in performing. The group did think the other two Sample Tasks were performed in the 63B MOS, so the "Y" is circled for those two tasks, and no substitutes appear.

Step 2. After agreeing on Sample Tasks or substitutes, you will individually complete the second major step, judging what should be the test score cutoffs on these tasks in order to be viewed as Marginal, Acceptable, or Outstanding performers (using the Performance Level Definitions).

To help make judgments for the second step, the form provides information about actual soldier performance on hands-on tests of the Sample Tasks. This test-score information is not based on SQT scores, where soldiers are allowed to practice repeatedly. The hands-on test scores referred to here are from specially-developed tests that were given with no advance warning and no practice allowed.

Look at the EXAMPLE again. In the EXAMPLE, 34 out of 100 soldiers score 55 or worse on the specially developed hands-on tests for these sample tasks. In other words, 34 out of 100 soldiers could correctly perform 55% or fewer of the steps in the hands-on tests.

The judge in this example decided that getting less than 55% correct on these tasks was Unacceptable and drew his line marking the Unacceptable category below 55. He felt that scores less than 75 were Marginal; 75 and above Acceptable. Finally, he felt that scores of 95 and better represent Outstanding performance. Nine out of 100 soldiers (100 minus 91) would be considered outstanding performers, according to this judge.

PLEASE put your name and the MOS you're rating in the spaces provided on EVERY page.

NOTE: As you make your ratings, think about soldiers who have about 24 months of service in this MOS after Basic and AIT. Also keep in mind all that you know about the full range of duty assignments for this MOS.

EXAMPLE

Task-Based Standard Setting Form

A. Mechanical Systems Maintenance: Inspect, install, maintain, or repair mechanical systems.

Sample Tasks	Part of the MOS? YES/NO	Substitute Tasks
1. Perform operator maintenance on M16A1 rifle.	Y N	1.
2. Replace transmission in rotor hub assembly.	Y N	2. Replace hydrovac in a 5-Ton
3. Replace wheel bearings.	Y N	3.

Actual Hands-On Test-Score Information for these Tasks:

	Test Score % OF Steps Correctly Performed	Number of Soldiers Who Score the Same or Worse Than This
O	100	100 out of 100 soldiers
	95	91 out of 100 soldiers
	90	82 out of 100 soldiers
A	85	73 out of 100 soldiers
	80	63 out of 100 soldiers
	75	57 out of 100 soldiers
	70	51 out of 100 soldiers
	65	47 out of 100 soldiers
M	60	42 out of 100 soldiers
	55	34 out of 100 soldiers
	50	26 out of 100 soldiers
U	45	25 out of 100 soldiers
	40	24 out of 100 soldiers
	35	23 out of 100 soldiers
	30	21 out of 100 soldiers
	25	16 out of 100 soldiers
	20	11 out of 100 soldiers
	15	10 out of 100 soldiers
	10	9 out of 100 soldiers

DRAW 3 LINES THAT MARK THE CUTOFFS BETWEEN THE CATEGORIES.

LABEL THE CATEGORIES: O (Ouststanding)
A (Acceptable)
M (Marginal)
U (Unacceptable)

Name: ____________________
MOS You Are Rating: __________

Task-Based Standard Setting Form

D. Vehicle and Equipment Operations: Drive or operate heavy mechanical equipment.

Sample Tasks	Part of the MOS? YES/NO	Substitute Tasks
1. Start/stop tank engine.	Y N	1.____________________
2. Couple/uncouple semitrailer.	Y N	2.____________________
3. Operate tractor/semitrailer.	Y N	3.____________________

Actual Hands-On Test-Score Information for these Tasks:

Test Score % OF Steps Correctly Performed	Number of Soldiers Who Score the Same or Worse Than This
100	100 out of 100 soldiers
95	87 out of 100 soldiers
90	78 out of 100 soldiers
85	70 out of 100 soldiers
80	62 out of 100 soldiers
75	51 out of 100 soldiers
70	39 out of 100 soldiers
65	32 out of 100 soldiers
60	24 out of 100 soldiers
55	18 out of 100 soldiers
50	11 out of 100 soldiers
45	9 out of 100 soldiers
40	6 out of 100 soldiers
35	5 out of 100 soldiers
30	3 out of 100 soldiers
25	2 out of 100 soldiers
20	1 out of 100 soldiers
15	1 out of 100 soldiers
10	1 out of 100 soldiers

DRAW 3 LINES THAT MARK THE CUTOFFS BETWEEN THE CATEGORIES

LABEL THE CATEGORIES: O (Ouststanding)
A (Acceptable)
M (Marginal)
U (Unacceptable)

Name: ____________________
MOS You Are Rating: __________

Task-Based Standard Setting Form

M. Individual Combat: Engage in combat and survival skills; know customs and laws of war.

Sample Tasks	Part of the MOS? YES/NO	Substitute Tasks
1. Engage targets with grenades.	Y N	1.______________
2. Load, reduce stoppage, and clear an M16A1 rifle.	Y N	2.______________
3. Put on protective clothing.	Y N	3.______________

Actual Hands-On Test-Score Information for these Tasks:

Test Score % OF Steps Correctly Performed	Number of Soldiers Who Score the Same or Worse Than This
100	100 out of 100 soldiers
95	78 out of 100 soldiers
90	63 out of 100 soldiers
85	52 out of 100 soldiers
80	40 out of 100 soldiers
75	32 out of 100 soldiers
70	23 out of 100 soldiers
65	19 out of 100 soldiers
60	14 out of 100 soldiers
55	11 out of 100 soldiers
50	8 out of 100 soldiers
45	7 out of 100 soldiers
40	5 out of 100 soldiers
35	4 out of 100 soldiers
30	2 out of 100 soldiers
25	2 out of 100 soldiers
20	1 out of 100 soldiers
15	1 out of 100 soldiers
10	1 out of 100 soldiers

DRAW 3 LINES THAT MARK THE CUTOFFS BETWEEN THE CATEGORIES

LABEL THE CATEGORIES: O (Ouststanding)
A (Acceptable)
M (Marginal)
U (Unacceptable)

Name: ____________________
MOS You Are Rating: __________

Task-Based Standard Setting Form -- RERATE

D. Vehicle and Equipment Operations: Drive or operate heavy mechanical equipment.

Sample Tasks	Part of the MOS? YES/NO	Substitute Tasks
1. Start/stop tank engine.	Y N	1.______________
2. Couple/uncouple semitrailer.	Y N	2.______________
3. Operate tractor/semitrailer.	Y N	3.______________

Actual Hands-On Test-Score Information for these Tasks:

Test Score % OF Steps Correctly Performed	Number of Soldiers Who Score the Same or Worse Than This
100	100 out of 100 soldiers
95	87 out of 100 soldiers
90	78 out of 100 soldiers
85	70 out of 100 soldiers
80	62 out of 100 soldiers
75	51 out of 100 soldiers
70	39 out of 100 soldiers
65	32 out of 100 soldiers
60	24 out of 100 soldiers
55	18 out of 100 soldiers
50	11 out of 100 soldiers
45	9 out of 100 soldiers
40	6 out of 100 soldiers
35	5 out of 100 soldiers
30	3 out of 100 soldiers
25	2 out of 100 soldiers
20	1 out of 100 soldiers
15	1 out of 100 soldiers
10	1 out of 100 soldiers

DRAW 3 LINES THAT MARK THE CUTOFFS BETWEEN THE CATEGORIES

LABEL THE CATEGORIES: O (Ouststanding)
A (Acceptable)
M (Marginal)
U (Unacceptable)

Name: ____________________

MOS You Are Rating: ____________

Task-Based Standard Setting Form -- RERATE

M. Individual Combat: Engage in combat and survival skills; know customs and laws of war.

Sample Tasks	Part of the MOS? YES/NO	Substitute Tasks
1. Engage targets with grenades.	Y N	1.____________________
2. Load, reduce stoppage, and clear an M16A1 rifle.	Y N	2.____________________
3. Put on protective clothing.	Y N	3.____________________

Actual Hands-On Test-Score Information for these Tasks:

Test Score % OF Steps Correctly Performed	Number of Soldiers Who Score the Same or Worse Than This
100	100 out of 100 soldiers
95	78 out of 100 soldiers
90	63 out of 100 soldiers
85	52 out of 100 soldiers
80	40 out of 100 soldiers
75	32 out of 100 soldiers
70	23 out of 100 soldiers
65	19 out of 100 soldiers
60	14 out of 100 soldiers
55	11 out of 100 soldiers
50	8 out of 100 soldiers
45	7 out of 100 soldiers
40	5 out of 100 soldiers
35	4 out of 100 soldiers
30	2 out of 100 soldiers
25	2 out of 100 soldiers
20	1 out of 100 soldiers
15	1 out of 100 soldiers
10	1 out of 100 soldiers

DRAW 3 LINES THAT MARK THE CUTOFFS BETWEEN THE CATEGORIES

LABEL THE CATEGORIES: O (Oustständing)
A (Acceptable)
M (Marginal)
U (Unacceptable)

Name:____

Task Complexity Questionnaire

12B: Combat Engineer

In this exercise, we would like you to provide information about the complexity or difficulty of sample tasks selected from two fairly general areas. These areas could apply to more than one MOS; some examples are Individual Combat, Vehicle and Equipment Operation, and Communication.

For each of the two tasks presented, there are 10 questions about the task. For several questions, there are definitions and examples to clarify the meaning of the question. Please read all definitions and examples before selecting an answer.

NOTE: If the sample task is not performed in the MOS you are rating, please use the substitute task you used in the standard setting exercise.

Task Category: D. Vehicle and Equipment Operations -- Drive or operate heavy mechanical equipment.

Sample Task: Operate tractor/semitrailer

For the **Vehicle and Equipment Operations** task listed here, please answer the following 10 questions. The answers to these 10 questions will provide information on the complexity of the task that is performed by soldiers in the MOS you are rating.

Please circle the most appropriate answer to each question.

Sample Task: Operate tractor/semitrailer

1. **Are job or memory aids used by the soldier in performing this task?**

   a. Yes
   b. No *(Go to No. 3 if you answer "No" to this question)*

Job and memory aids include memory joggers learned in school (e g., S-A-L-U-T-E), instructions printed on or attached to equipment, checklists or worksheets, and manuals that are routinely used while performing the task.

2. **How would you rate the quality of the job or memory aid?**

   a. There are no job or memory aids for this task.
   b. Poor. Even with the job/memory aid, a typical soldier would need a great deal of additional information.
   c. Marginally Good. Even with the job/memory aid, a soldier would need important additional information.
   d. Very Good. With the job/memory aid, a soldier would need only a little additional information.
   e. Excellent. Using the job/memory aid, a soldier can do the entire task correctly with no additional information or help.

3. **Into how many steps is this task typically divided?**

   a. 1 Step
   b. 2-5 Steps
   c. 6-10 Steps
   d. More than 10 Steps

A step is a separate physical or mental activity within a task which has a vell defined, observable beginning and ending point.

4. **Are the steps in this task required to be performed in a definite sequence?**

   a. The tasks typically have only 1 step.
   b. None are required to be performed in a particular sequence.
   c. Some, but not all steps must be performed in the correct sequence.
   d. All of the steps must be performed in the correct sequence.

5. **Does the task provide built-in feedback so that you can tell if you are doing them correctly?**

   a. Built-in feedback is provided for all steps
   b. Built-in feedback is provided for most steps (> 50%)
   c. Built-in feedback is provided for only a few steps
   d. No Built-in feedback is provided for any steps.

Examples of built-in feedback include disassembling equipment where removing one section automatically uncovers the next section; steps with observable effects such as buzzers, meter readings, warning lights; and operating equipment built to indicate a logical progression (for example, adjusting dials from left-to-right).

Sample Task: Operate tractor/semitrailer

6. **Does the task or parts of the task have a time limit for its completion?**

   a. There are no time limits
   b. There are time limits that are fairly easy to meet under test conditions
   c. There are time limits that are difficult to meet under test conditions.

7. **How difficult are the mental processing (thinking, analyzing, judging, inferring, and problem solving) requirements of this task?**

   a. Almost no mental processing is required (physical or highly repetitive tasks)
   b. Simple mental processing is required (gross comparisons, simple estimations or calculations)
   c. Complex mental processing is required (choices or decisions based on subtle but discrete clues)
   d. Very complex mental processing is required (rapid decisions, based on detailed information, often under stress)

8. **How many facts, terms, names, rules, or ideas must a soldier memorize in order to do this task?**

   a. None (or all are provided by memory/job aids)
   b. A few (1-3)
   c. Some (4-8)
   d. Very Many (more than 8)

9. **How hard are the facts or terms that must be remembered?**

   a. There are not facts or terms to be remembered
   b. Not at all hard - the information is simple
   c. Somewhat hard - some of the information is complex
   d. Very hard - the facts, rules, and terms are technical or specific to the task and must be remembered in exact detail.

10. **What are the motor control demands of this task?**

   a. None
   b. Small, but noticeable degree of motor control is required (such as driving a nail, adjusting a dial)
   c. Considerable degree of motor control is needed (such as typing, driving a manual shift vehicle, or tracking a moving target)
   d. A very large degree of motor control is needed (such as repair of delicate equipment, or sending Morse code using a key)

Task Category: M. Individual Combat -- Engage in combat and survival skills; know customs and laws of war.

Sample Task: Put on Protective Clothing

For the Individual Combat task listed here, please answer the following 10 questions. The answers to these 10 questions will provide information on the complexity of the task that is performed by soldiers in the MOS you are rating.

Please circle the most appropriate answer to each question.

1. **Are job or memory aids used by the soldier in performing this task?**

   a. Yes
   b. No *(Go to No. 3 if you answer "No" to this question)*

Job and memory aids include memory joggers learned in school (e.g., S-A-L-U-T-E), instructions printed on or attached to equipment, checklists or worksheets, and manuals that are routinely used while performing the task.

2. **How would you rate the quality of the job or memory aid?**

   a. There are no job or memory aids for this task.
   b. Poor. Even with the job/memory aid, a typical soldier would need a great deal of additional information.
   c. Marginally Good. Even with the job/memory aid, a soldier would need important additional information.
   d. Very Good. With the job/memory aid, a soldier would need only a little additional information.
   e. Excellent. Using the job/memory aid, a soldier can do the entire task correctly with no additional information or help.

3. **Into how many steps is this task typically divided?**

   a. 1 Step
   b. 2-5 Steps
   c. 6-10 Steps
   d. More than 10 Steps

A step is a separate physical or mental activity within a task which has a well defined, observable beginning and ending point.

4. **Are the steps in this task required to be performed in a definite sequence?**

   a. The tasks typically have only 1 step.
   b. None are required to be performed in a particular sequence.
   c. Some, but not all steps must be performed in the correct sequence.
   d. All of the steps must be performed in the correct sequence.

5. **Does the task provide built-in feedback so that you can tell if you are doing them correctly?**

   a. Built-in feedback is provided for all steps
   b. Built-in feedback is provided for most steps (> 50%)
   c. Built-in feedback is provided for only a few steps
   d. No Built-in feedback is provided for any steps.

Sample Task: Put on Protective Clothing

Examples of built-in feedback include disassembling equipment where removing one section automatically uncovers the next section; steps with observable effects such as buzzers, meter readings, warning lights; and operating equipment built to indicate a logical progression (for example, adjusting dials from left-to-right).

6. **Does the task or parts of the task have a time limit for its completion?**

   a. There are no time limits
   b. There are time limits that are fairly easy to meet under test conditions
   c. There are time limits that are difficult to meet under test conditions.

7. **How difficult are the mental processing (thinking, analyzing, judging, inferring, and problem solving) requirements of this task?**

   a. Almost no mental processing is required (physical or highly repetitive tasks)
   b. Simple mental processing is required (gross comparisons, simple estimations or calculations)
   c. Complex mental processing is required (choices or decisions based on subtle but discrete clues)
   d. Very complex mental processing is required (rapid decisions, based on detailed information, often under stress)

8. **How many facts, terms, names, rules, or ideas must a soldier memorize in order to do this task?**

   a. None (or all are provided by memory/job aids)
   b. A few (1-3)
   c. Some (4-8)
   d. Very Many (more than 8)

9. **How hard are the facts or terms that must be remembered?**

   a. There are not facts or terms to be remembered
   b. Not at all hard - the information is simple
   c. Somewhat hard - some of the information is complex
   d. Very hard - the facts, rules, and terms are technical or specific to the task and must be remembered in exact detail.

10. **What are the motor control demands of this task?**

   a. None
   b. Small, but noticeable degree of motor control is required (such as driving a nail, adjusting a dial)
   c. Considerable degree of motor control is needed (such as typing, driving a manual shift vehicle, or tracking a moving target)
   d. A very large degree of motor control is needed (such as repair of delicate equipment, or sending Morse code using a key)

Appendix B

Army Task Questionnaire: Mean Ratings of Each Component by MOS and Rating Scales

Table B.1

Army Task Questionnaire Mean Ratings: 12B - Combat Engineer

Task Categories	Rating FRE N=77	CTI N=77	GSI N=77	OJI N=77	DIF N=77
Handle demolitions/mines	4.13	4.54	2.98	4.27	3.68
Operate wheeled vehicle	3.97	3.67	3.57	3.93	2.76
Perform op maint chcks/svcs	3.94	3.71	3.98	4.13	2.71
Fire individual weapons	3.90	3.87	4.37	4.44	3.01
Survive in the field	3.90	3.81	4.13	4.31	3.37
Use maps	3.89	4.20	4.07	4.37	3.26
Place/camoufl tact equip/mater	3.81	4.05	3.71	4.07	3.14
Move/react in the field	3.76	3.63	3.92	4.07	3.24
Send/receive radio messages	3.71	3.75	4.07	4.06	2.94
Protect against NBC hazards	3.66	3.54	4.22	4.20	3.45
Perform op chcks/svcs on weap	3.63	3.69	4.30	4.27	2.59
Navigate	3.54	3.84	4.13	4.31	3.67
Act as a model	3.54	3.37	3.94	4.01	3.33
Read tech manl/field manl/etc	3.49	3.71	3.70	3.89	2.72
Give directions/instructions	3.33	3.42	3.51	3.63	2.98
Sketch maps/overlays/range cards	3.24	3.45	3.32	3.75	3.29
Communicate	3.23	3.10	3.53	3.58	3.05
Give short oral reports	3.20	3.27	3.37	3.48	2.93
Give first aid	3.16	3.46	4.22	4.13	3.42
Lead	3.14	3.42	3.63	3.81	3.54
Operate track vehicle	2.88	2.72	2.39	2.97	2.58
Use hand & arm signals	2.80	2.84	3.05	3.20	2.31
Monitor/inspect	2.75	2.87	3.07	3.20	2.81
Counsel	2.71	2.55	3.06	3.09	3.01
Use hand grenades	2.71	3.07	3.63	3.62	2.23
Detect/identify targets	2.67	2.81	3.18	3.32	3.10
Train	2.67	2.80	3.07	3.10	2.93
Direct/lead teams	2.55	3.00	3.03	3.35	3.41
Engage in hand-to-hand combat	2.37	2.59	2.87	2.98	3.11
Plan placement/use tact equip	2.33	2.78	2.60	3.02	2.87
Control individuals/crowds	2.32	2.32	2.78	2.88	2.56
Pack/load materials	2.27	2.11	2.35	2.55	2.63
Know customs/laws of war	2.26	2.39	2.93	2.96	2.59
Construct wooden bldgs/struct	2.22	2.87	1.50	2.55	3.29
Paint	1.98	1.23	1.31	1.36	1.26
Plan operations	1.98	2.28	2.31	2.41	3.01
Decode data	1.98	2.50	2.63	2.70	3.06
Compute statistics/other math	1.97	2.53	1.75	2.45	2.83

(table continues)

Table B.1 (continued)

Task Categories	Rating FRE N=77	CTI N=77	GSI N=77	OJI N=77	DIF N=77
Operate power excavating equip	1.94	2.54	1.39	2.27	2.70
Assemble steel structures	1.90	2.57	1.51	2.34	2.94
Install electronic components	1.89	1.96	2.22	2.20	2.07
Operate gas/electric power equip	1.76	2.03	1.44	1.96	2.24
Provide counseling	1.64	1.62	1.80	1.90	1.86
Personnel Administration	1.58	1.45	1.83	1.88	2.05
Operate electronic equipment	1.51	1.85	2.14	2.19	1.90
Operate boats	1.44	1.75	1.10	1.70	2.24
Conduct land surveys	1.36	1.71	1.20	1.63	2.01
Construct masonry bldgs/struct	1.33	1.97	1.02	1.79	2.79
Repair mechanical systems	1.33	1.51	1.63	1.68	2.40
Install wire/cables	1.28	1.42	1.50	1.55	1.42
Order equipment/supplies	1.14	1.31	1.33	1.51	1.55
Troubleshoot weapons	1.06	1.44	1.64	1.59	1.88
Prep technical forms/documents	0.93	1.11	1.14	1.31	1.50
Operate lift/load/grade equip	0.92	1.14	0.63	1.07	1.90
Record/file/dispatch information	0.88	0.85	1.03	1.09	1.37
Receive/store/issue supp/equip	0.87	0.93	1.11	1.19	1.26
Analyze weather conditions	0.85	0.93	0.90	1.00	1.18
Draw maps/overlays	0.75	0.77	0.72	0.84	1.24
Write/deliver presentations	0.74	0.86	0.88	0.96	1.39
Prep equip/supplies for air drop	0.74	1.00	0.85	1.05	1.48
Type	0.72	0.61	0.80	0.71	1.50
Troubleshoot mechanical systems	0.70	1.02	0.96	1.09	1.36
Write documents/correspondence	0.62	0.70	0.83	0.85	1.14
Determine fire data-indirect weap	0.59	0.72	0.83	0.87	1.01
Analyze intelligence data	0.59	0.80	0.83	0.84	1.14
Draw illustrations	0.49	0.58	0.44	0.54	0.88
Use audiovisual equipment	0.45	0.45	0.50	0.58	0.67
Repair weapons	0.41	0.54	0.68	0.62	0.88
Repair metal	0.40	0.54	0.25	0.44	0.97
Reproduce printed material	0.40	0.31	0.42	0.41	0.36
Fire heavy direct fire weapons	0.35	0.46	0.46	0.53	0.64
Produce technical drawings	0.32	0.44	0.20	0.33	0.98
Interview	0.31	0.38	0.35	0.42	0.63
Estimate time/cost of maint ops	0.28	0.37	0.29	0.39	0.53
Operate computer hardware	0.27	0.29	0.31	0.36	0.84
Install pipe assemblies	0.27	0.39	0.18	0.35	0.71
Prepare parachutes	0.24	0.32	0.35	0.39	0.57
Inspect electrical systems	0.24	0.45	0.41	0.42	0.50
Repair electrical systems	0.23	0.33	0.33	0.32	0.55
Repair plastic/fiberglass	0.14	0.23	0.18	0.22	0.45
Control money	0.14	0.10	0.09	0.11	0.16
Fire indirect fire weapons	0.14	0.15	0.19	0.18	0.22
Receive clients/patients/guests	0.13	0.13	0.11	0.11	0.14

(table continues)

Table B.1 (continued)

Task Categories	Rating FRE N=77	CTI N=77	GSI N=77	OJI N=77	DIF N=77
Repair electronic components	0.13	0.14	0.14	0.15	0.28
Analyze electronic signals	0.10	0.06	0.13	0.13	0.28
Control air traffic	0.10	0.11	0.14	0.14	0.18
Inspect electronic systems	0.09	0.14	0.19	0.18	0.19
Prep heavy weap for tactical use	0.09	0.09	0.09	0.07	0.13
Provide medical/dental treatment	0.06	0.06	0.06	0.05	0.10
Load/unload artillery/tank guns	0.03	0.05	0.07	0.07	0.11
Provide programming/DP support	0.03	0.03	0.03	0.03	0.13
Translate foreign languages	0.03	0.06	0.05	0.05	0.19
Cook	0.01	0.00	0.01	0.01	0.02
Operate radar	0.00	0.00	0.00	0.00	0.00
Perform medical lab procedures	0.00	0.00	0.00	0.00	0.00
Select/lay/clean med/dent equip	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.2

Army Task Questionnaire Mean Ratings: 13B - Cannon Crewman

Task Categories	Rating FRE N=69	CTI N=69	GSI N=69	OJI N=69	DIF N=66
Load/unload artillery/tank guns	4.55	4.72	2.66	4.10	2.97
Fire indirect fire weapons	4.52	4.63	2.73	4.18	3.42
Prep heavy weap for tactical use	4.34	4.59	2.73	4.08	3.22
Place/camoufl tact equip/mater	4.11	3.98	3.73	3.95	2.83
Operate wheeled vehicle	4.05	4.04	3.66	4.08	2.68
Perform op maint chcks/svcs	3.97	4.26	3.84	4.26	3.15
Perform op chcks/svcs on weap	3.72	4.33	4.15	4.36	3.21
Protect against NBC hazards	3.65	3.92	4.44	4.39	3.34
Survive in the field	3.62	3.94	4.13	4.17	3.28
Read tech manl/field manl/etc	3.60	3.79	3.68	3.82	2.84
Fire individual weapons	3.56	3.81	4.42	4.30	2.86
Use maps	3.36	3.63	3.85	3.84	3.27
Sketch maps/overlays/range cards	3.29	3.36	3.37	3.47	3.00
Act as a model	3.25	3.25	3.51	3.61	3.09
Operate track vehicle	3.18	3.37	2.78	3.20	2.34
Use hand & arm signals	3.17	3.40	3.21	3.34	2.33
Lead	3.05	3.01	3.23	3.34	2.77
Pack/load materials	2.98	3.07	2.65	3.08	2.59
Give first aid	2.97	3.34	4.24	4.14	3.39
Give directions/instructions	2.97	3.08	3.26	3.29	2.47
Counsel	2.76	2.69	3.04	3.07	2.86
Train	2.70	2.86	2.91	3.01	2.53
Communicate	2.69	2.95	3.20	3.23	2.67
Navigate	2.69	3.43	3.62	3.63	3.36
Know customs/laws of war	2.59	2.42	3.02	2.98	2.56
Give short oral reports	2.55	2.71	3.21	3.05	2.30
Monitor/inspect	2.52	2.60	2.81	2.87	2.53
Move/react in the field	2.50	2.91	3.29	3.20	2.56
Send/receive radio messages	2.49	2.89	3.27	3.21	2.71
Control individuals/crowds	2.49	2.30	2.91	2.72	2.24
Fire heavy direct fire weapons	2.46	2.92	1.92	2.60	2.24
Install wire/cables	2.43	2.53	2.20	2.60	1.69
Troubleshoot weapons	2.40	3.40	3.04	3.36	3.23
Detect/identify targets	2.23	2.85	2.98	3.01	2.83
Install electronic components	2.16	2.30	2.38	2.54	2.25
Paint	2.14	1.39	1.50	1.52	1.22
Use hand grenades	2.01	2.71	3.40	3.24	2.10
Repair mechanical systems	2.00	2.98	2.46	2.75	3.01
Plan placement/use tact equip	1.92	2.42	2.44	2.41	2.21
Direct/lead teams	1.84	2.21	2.27	2.29	1.93
Personnel Administration	1.77	1.88	1.91	2.02	1.92
Order equipment/supplies	1.71	1.94	2.15	2.18	2.40

(table continues)

Table B.2 (continued)

Task Categories	Rating FRE N=69	CTI N=69	GSI N=69	OJI N=69	DIF N=66
Handle demolitions/mines	1.66	2.10	2.23	2.30	2.31
Provide counseling	1.62	1.81	1.98	2.05	1.90
Prep technical forms/documents	1.60	2.02	1.65	1.92	2.18
Troubleshoot mechanical systems	1.58	2.24	1.89	2.05	2.40
Repair weapons	1.56	2.53	2.01	2.40	2.51
Operate electronic equipment	1.55	2.01	2.10	2.20	2.01
Determine fire data-indirect weap	1.52	1.89	1.31	1.87	1.98
Engage in hand-to-hand combat	1.46	1.56	2.07	2.00	2.37
Conduct land surveys	1.43	1.77	1.55	1.76	1.84
Decode data	1.42	2.07	2.30	2.30	2.59
Plan operations	1.24	1.47	1.52	1.58	1.80
Receive/store/issue supp/equip	1.07	1.14	1.25	1.26	1.30
Record/file/dispatch information	1.07	1.14	1.33	1.33	1.45
Prep equip/supplies for air drop	1.02	1.31	0.97	1.29	1.47
Compute statistics/other math	0.95	1.15	1.05	1.23	1.12
Inspect electrical systems	0.82	1.07	1.00	1.02	1.38
Operate gas/electric power equip	0.78	0.94	0.84	0.94	1.16
Write documents/correspondence	0.63	0.73	0.89	0.94	1.19
Type	0.63	0.65	0.68	0.84	1.18
Repair electrical systems	0.58	0.70	0.70	0.76	1.13
Inspect electronic systems	0.57	0.69	0.67	0.76	1.06
Reproduce printed material	0.56	0.40	0.52	0.49	0.60
Analyze weather conditions	0.52	0.55	0.57	0.60	0.84
Interview	0.50	0.71	0.85	0.76	0.72
Operate computer hardware	0.49	0.49	0.53	0.55	0.90
Analyze intelligence data	0.45	0.57	0.67	0.60	0.75
Write/deliver presentations	0.44	0.53	0.62	0.60	0.77
Repair electronic components	0.44	0.44	0.47	0.55	0.83
Draw maps/overlays	0.43	0.59	0.68	0.68	0.74
Use audiovisual equipment	0.37	0.30	0.44	0.37	0.47
Repair metal	0.34	0.37	0.39	0.38	0.65
Control money	0.33	0.39	0.40	0.40	0.50
Prepare parachutes	0.31	0.46	0.44	0.47	0.51
Construct wooden bldgs/struct	0.31	0.31	0.34	0.30	0.43
Estimate time/cost of maint ops	0.29	0.30	0.29	0.30	0.45
Assemble steel structures	0.26	0.29	0.36	0.32	0.35
Receive clients/patients/guests	0.23	0.18	0.27	0.24	0.27
Provide programming/DP support	0.22	0.27	0.27	0.30	0.27
Draw illustrations	0.20	0.22	0.23	0.25	0.23
Operate lift/load/grade equip	0.20	0.24	0.24	0.24	0.33
Provide medical/dental treatment	0.18	0.24	0.26	0.26	0.25
Repair plastic/fiberglass	0.17	0.18	0.17	0.20	0.33
Control air traffic	0.15	0.23	0.21	0.24	0.31
Install pipe assemblies	0.15	0.13	0.18	0.17	0.18

(table continues)

Table B.2 (continued)

Task Categories	Rating FRE N=69	CTI N=69	GSI N=69	OJI N=69	DIF N=66
Cook	0.14	0.18	0.26	0.24	0.19
Construct masonry bldgs/struct	0.11	0.14	0.13	0.14	0.19
Operate power excavating equip	0.10	0.13	0.15	0.13	0.18
Operate radar	0.08	0.13	0.10	0.11	0.22
Analyze electronic signals	0.08	0.08	0.10	0.10	0.12
Translate foreign languages	0.08	0.11	0.13	0.13	0.25
Perform medical lab procedures	0.07	0.10	0.11	0.11	0.12
Produce technical drawings	0.07	0.08	0.13	0.11	0.16
Select/lay/clean med/dent equip	0.05	0.04	0.07	0.07	0.04
Operate boats	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.3

Army Task Questionnaire Mean Ratings: 27E - TOW/Dragon Repairer

Task Categories	Rating				
	FRE N=34	CTI N=34	GSI N=34	OJI N=34	DIF N=33
Inspect electronic systems	4.23	4.38	1.73	3.64	3.54
Read tech manl/field manl/etc	4.23	4.41	3.76	4.08	2.75
Inspect electrical systems	3.94	4.02	1.82	3.47	3.39
Repair electrical systems	3.94	4.11	1.79	3.47	3.33
Repair electronic components	3.88	4.26	1.76	3.61	3.36
Perform op maint chcks/svcs	3.67	3.58	3.79	3.85	2.87
Act as a model	3.61	3.55	4.02	4.02	3.06
Troubleshoot weapons	3.55	3.70	2.20	3.41	3.09
Install electronic components	3.52	3.73	2.00	3.35	3.00
Operate wheeled vehicle	3.47	3.55	3.52	3.76	2.36
Repair mechanical systems	3.47	3.55	2.02	3.05	2.97
Operate electronic equipment	3.44	4.00	2.64	3.61	3.18
Communicate	3.26	3.35	3.70	3.73	2.81
Lead	3.18	3.09	3.45	3.45	2.87
Repair weapons	3.17	3.11	1.85	2.82	2.84
Monitor/inspect	3.12	3.30	3.27	3.36	2.81
Give directions/instructions	2.88	2.91	3.00	3.02	2.54
Counsel	2.88	2.64	3.14	3.14	2.51
Fire individual weapons	2.85	2.05	4.26	4.08	2.54
Protect against NBC hazards	2.79	2.73	4.23	4.23	3.15
Prep technical forms/documents	2.73	3.00	1.97	2.76	2.45
Train	2.70	2.85	3.14	3.29	2.60
Perform op chcks/svcs on weap	2.61	.67	4.11	3.88	2.69
Order equipment/supplies	2.47	[illegible]7	1.76	2.73	2.45
Survive in the field	2.44	2.29	3.76	3.64	2.97
Give first aid	2.42	2.15	3.93	3.81	3.19
Use maps	2.35	2.70	3.81	3.67	3.06
Personnel Administration	2.08	2.11	2.44	2.55	2.00
Troubleshoot mechanical systems	2.05	1.97	1.23	1.85	1.90
Send/receive radio messages	2.02	2.14	3.39	3.20	2.48
Repair plastic/fiberglass	2.00	2.45	1.27	2.00	1.90
Record/file/dispatch information	1.88	2.05	1.61	2.05	2.06
Place/camoufl tact equip/mater	1.82	1.94	2.55	2.50	1.90
Sketch maps/overlays/range cards	1.82	1.58	2.91	2.73	2.84
Navigate	1.79	1.97	3.00	3.00	2.57
Plan operations	1.78	2.12	2.36	2.39	2.15
Operate gas/electric power equip	1.76	2.26	1.64	2.20	1.97
Know customs/laws of war	1.64	1.02	2.67	2.52	2.06
Plan placement/use tact equip	1.64	1.56	2.50	2.37	2.03
Receive/store/issue supp/equip	1.61	1.76	1.26	1.70	1.66
Move/react in the field	1.61	1.21	2.69	2.57	2.09
Give short oral reports	1.58	1.23	2.32	2.11	1.75

(table continues)

Table B.3 (continued)

Task Categories	Rating FRE N=34	 CTI N=34	 GSI N=34	 OJI N=34	 DIF N=33
Detect/identify targets	1.57	1.18	2.72	2.51	2.18
Pack/load materials	1.52	1.73	1.94	2.05	2.00
Direct/lead teams	1.51	1.69	2.27	2.27	1.90
Provide counseling	1.38	1.51	1.78	1.87	1.59
Estimate time/cost of maint ops	1.38	1.67	0.97	1.52	1.45
Control individuals/crowds	1.29	0.52	1.85	1.73	1.69
Paint	1.23	1.35	1.23	1.50	1.18
Install wire/cables	1.23	1.55	1.23	1.41	1.54
Operate computer hardware	1.23	1.47	0.94	1.44	2.03
Use hand & arm signals	1.14	0.79	2.09	1.90	1.48
Use hand grenades	0.94	0.70	2.41	2.14	1.51
Type	0.88	0.79	0.79	0.97	1.33
Write documents/correspondence	0.88	0.97	0.91	1.00	1.18
Write/deliver presentations	0.76	0.78	0.97	1.00	0.96
Compute statistics/other math	0.73	1.17	0.76	1.11	1.42
Operate track vehicle	0.70	0.88	0.82	0.94	1.18
Decode data	0.64	0.85	1.26	1.26	1.30
Repair metal	0.64	0.91	0.55	0.91	1.06
Engage in hand-to-hand combat	0.61	0.29	1.23	1.05	1.39
Use audiovisual equipment	0.58	0.47	0.55	0.64	0.66
Conduct land surveys	0.55	0.55	1.14	1.08	0.97
Prep equip/supplies for air drop	0.50	0.44	0.67	0.64	0.78
Reproduce printed material	0.47	0.35	0.38	0.47	0.48
Handle demolitions/mines	0.47	0.29	0.91	0.85	1.00
Prep heavy weap for tactical use	0.44	0.55	0.64	0.64	0.57
Fire heavy direct fire weapons	0.41	0.41	0.55	0.61	0.60
Receive clients/patients/guests	0.32	0.26	0.23	0.35	0.24
Interview	0.32	0.38	0.29	0.41	0.42
Draw maps/overlays	0.26	0.17	0.20	0.20	0.27
Draw illustrations	0.26	0.35	0.29	0.38	0.36
Provide programming/DP support	0.20	0.20	0.32	0.35	0.39
Produce technical drawings	0.17	0.17	0.05	0.14	0.21
Analyze intelligence data	0.14	0.20	0.38	0.32	0.33
Determine fire data-indirect weap	0.14	0.05	0.17	0.08	0.06
Analyze electronic signals	0.14	0.17	0.11	0.20	0.21
Construct wooden bldgs/struct	0.14	0.05	0.14	0.11	0.24
Translate foreign languages	0.08	0.05	0.05	0.08	0.12
Analyze weather conditions	0.08	0.11	0.23	0.23	0.21
Operate radar	0.08	0.14	0.08	0.11	0.09
Prepare parachutes	0.08	0.02	0.14	0.14	0.18
Assemble steel structures	0.05	0.05	0.05	0.08	0.15
Operate lift/load/grade equip	0.05	0.05	0.05	0.05	0.18
Control money	0.02	0.02	0.02	0.02	0.00
Select/lay/clean med/dent equip	0.02	0.05	0.00	0.05	0.06

(table continues)

Table B.3 (continued)

Task Categories	Rating				
	FRE N=34	CTI N=34	GSI N=34	OJI N=34	DIF N=33
Operate power excavating equip	0.02	0.00	0.00	0.00	0.00
Load/unload artillery/tank guns	0.02	0.02	0.08	0.08	0.09
Fire indirect fire weapons	0.00	0.00	0.00	0.00	0.00
Cook	0.00	0.00	0.00	0.00	0.00
Operate boats	0.00	0.00	0.00	0.00	0.00
Control air traffic	0.00	0.00	0.00	0.00	0.00
Provide medical/dental treatment	0.00	0.00	0.00	0.00	0.00
Install pipe assemblies	0.00	0.00	0.00	0.00	0.00
Perform medical lab procedures	0.00	0.00	0.00	0.00	0.00
Construct masonry bldgs/struct	0.00	0.00	0.00	0.00	0.00

<u>Note</u>. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.4

Army Task Questionnaire Mean Ratings: 29E - Radio Repairer

Task Categories	Rating				
	FRE N=49	CTI N=49	GSI N=49	OJI N=49	DIF N=48
Inspect electronic systems	4.44	4.71	1.95	3.91	3.85
Operate electronic equipment	4.40	4.40	2.71	4.00	3.12
Repair electronic components	4.32	4.65	1.89	4.00	3.91
Repair electrical systems	4.28	4.42	1.95	3.85	3.77
Install electronic components	4.22	4.46	2.40	3.83	3.16
Read tech manl/field manl/etc	4.08	4.49	3.49	4.10	3.00
Inspect electrical systems	4.06	4.46	1.89	3.73	3.52
Perform op maint chcks/svcs	3.20	2.87	3.38	3.61	2.41
Act as a model	3.10	3.10	3.62	3.62	2.83
Communicate	2.87	2.77	3.38	3.49	2.72
Operate wheeled vehicle	2.81	2.55	3.28	3.38	2.27
Prep technical forms/documents	2.67	2.91	1.93	2.83	2.53
Send/receive radio messages	2.65	2.69	3.53	3.44	2.52
Lead	2.55	2.77	3.22	3.24	2.81
Train	2.44	2.62	3.00	3.12	2.61
Counsel	2.34	2.02	2.52	2.62	2.27
Fire individual weapons	2.26	1.81	4.20	3.83	2.62
Perform op chcks/svcs on weap	2.24	2.36	4.14	3.89	2.23
Use maps	2.24	2.14	3.75	3.45	2.83
Order equipment/supplies	2.22	2.63	1.91	2.48	2.39
Protect against NBC hazards	2.20	1.87	3.83	3.59	2.77
Give directions/instructions	2.18	2.26	2.73	2.75	2.29
Operate gas/electric power equip	2.16	2.55	2.00	2.73	2.29
Monitor/inspect	2.08	1.95	2.20	2.40	1.95
Give first aid	1.91	2.14	3.87	3.71	3.20
Survive in the field	1.89	1.87	3.65	3.44	2.89
Install wire/cables	1.89	2.35	1.97	2.45	1.97
Navigate	1.77	1.71	3.51	3.32	3.02
Personnel Administration	1.59	1.49	1.81	1.87	1.66
Receive/store/issue supp/equip	1.55	1.93	1.30	1.83	1.70
Pack/load materials	1.51	1.69	2.04	2.30	2.18
Record/file/dispatch information	1.42	1.42	1.26	1.59	1.52
Estimate time/cost of maint ops	1.40	1.79	0.89	1.49	1.56
Repair mechanical systems	1.38	1.83	1.36	1.73	1.68
Move/react in the field	1.36	1.26	3.14	2.91	2.41
Give short oral reports	1.36	1.22	2.18	2.00	1.68
Know customs/laws of war	1.32	0.89	2.32	2.16	1.87
Provide counseling	1.28	1.24	1.57	1.67	1.43
Type	1.24	1.24	1.06	1.36	1.60
Operate computer hardware	1.22	1.18	0.89	1.18	1.63
Use hand & arm signals	1.20	0.91	1.83	1.71	1.29
Control individuals/crowds	1.18	0.79	1.85	1.70	1.57

(table continues)

Table B.4 (continued)

Task Categories	Rating FRE N=49	CTI N=49	GSI N=49	OJI N=49	DIF N=48
Sketch maps/overlays/range cards	1.14	0.81	1.95	1.79	1.64
Detect/identify targets	1.14	1.00	2.51	2.18	2.14
Place/camoufl tact equip/mater	1.12	1.14	2.44	2.24	1.91
Use hand grenades	1.04	0.65	2.49	2.08	1.55
Decode data	1.02	1.16	1.59	1.55	2.00
Plan placement/use tact equip	1.00	0.93	1.74	1.61	1.54
Plan operations	0.95	1.08	1.30	1.42	1.41
Paint	0.89	0.71	0.93	0.98	0.87
Analyze electronic signals	0.87	0.87	0.53	0.77	1.02
Write documents/correspondence	0.79	0.91	0.89	1.10	1.25
Troubleshoot mechanical systems	0.69	0.85	0.59	0.83	0.89
Compute statistics/other math	0.67	1.04	0.69	1.02	1.25
Write/deliver presentations	0.63	0.71	0.91	0.95	1.12
Handle demolitions/mines	0.55	0.53	1.04	1.00	1.10
Direct/lead teams	0.55	0.42	1.02	1.00	1.08
Engage in hand-to-hand combat	0.55	0.24	1.04	1.02	1.08
Troubleshoot weapons	0.53	0.59	0.91	0.87	0.64
Reproduce printed material	0.51	0.40	0.44	0.67	0.54
Use audiovisual equipment	0.44	0.55	0.49	0.55	0.50
Conduct land surveys	0.42	0.24	0.85	0.83	0.81
Prep equip/supplies for air drop	0.40	0.46	0.51	0.65	0.77
Repair metal	0.38	0.42	0.26	0.44	0.56
Assemble steel structures	0.34	0.55	0.53	0.65	0.77
Operate radar	0.34	0.51	0.38	0.44	0.64
Operate track vehicle	0.30	0.30	0.40	0.46	0.52
Draw illustrations	0.26	0.32	0.34	0.34	0.27
Interview	0.24	0.40	0.36	0.46	0.47
Prepare parachutes	0.24	0.24	0.28	0.28	0.33
Analyze intelligence data	0.18	0.26	0.40	0.40	0.33
Draw maps/overlays	0.16	0.16	0.32	0.28	0.22
Repair weapons	0.16	0.18	0.24	0.26	0.25
Determine fire data-indirect weap	0.14	0.24	0.30	0.32	0.31
Repair plastic/fiberglass	0.12	0.24	0.08	0.24	0.35
Produce technical drawings	0.12	0.10	0.08	0.14	0.16
Control money	0.10	0.10	0.14	0.12	0.12
Analyze weather conditions	0.10	0.10	0.12	0.10	0.27
Operate lift/load/grade equip	0.10	0.10	0.08	0.12	0.27
Receive clients/patients/guests	0.08	0.12	0.18	0.12	0.22
Construct wooden bldgs/struct	0.08	0.02	0.02	0.08	0.14
Operate boats	0.06	0.06	0.08	0.08	0.12
Fire indirect fire weapons	0.06	0.08	0.08	0.12	0.12
Fire heavy direct fire weapons	0.06	0.08	0.06	0.08	0.16
Provide programming/DP support	0.06	0.02	0.02	0.08	0.12
Construct masonry bldgs/struct	0.06	0.02	0.02	0.02	0.06

(table continues)

Table B.4 (continued)

Task Categories	Rating FRE N=49	CTI N=49	GSI N=49	OJI N=49	DIF N=48
Install pipe assemblies	0.04	0.02	0.02	0.02	0.10
Translate foreign languages	0.04	0.08	0.08	0.08	0.08
Select/lay/clean med/dent equip	0.04	0.06	0.06	0.06	0.06
Operate power excavating equip	0.04	0.04	0.04	0.04	0.08
Control air traffic	0.02	0.02	0.02	0.02	0.06
Prep heavy weap for tactical use	0.02	0.02	0.02	0.02	0.10
Load/unload artillery/tank guns	0.02	0.02	0.02	0.02	0.10
Perform medical lab procedures	0.00	0.00	0.00	0.00	0.00
Provide medical/dental treatment	0.00	0.00	0.00	0.00	0.00
Cook	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.5

Army Task Questionnaire Mean Ratings: 31C - Single Channel Radio Operator

Task Categories	Rating FRE N=76	CTI N=76	GSI N=76	OJI N=76	DIF N=76
Send/receive radio messages	4.67	4.63	3.85	4.34	3.00
Operate electronic equipment	4.39	4.52	2.77	4.03	3.35
Type	4.30	4.23	2.30	3.63	2.90
Install electronic components	4.28	4.44	2.72	3.88	3.38
Perform op maint chcks/svcs	4.27	4.29	3.88	4.30	2.70
Operate wheeled vehicle	4.21	3.88	3.90	4.05	2.45
Operate gas/electric power equip	3.86	4.02	2.64	3.69	2.92
Read tech manl/field manl/etc	3.82	4.27	3.89	4.10	2.64
Decode data	3.68	4.05	3.32	3.72	3.34
Act as a model	3.52	3.13	3.86	3.81	3.03
Survive in the field	3.32	3.27	4.18	4.01	3.19
Lead	3.30	3.13	3.84	3.80	3.28
Communicate	3.21	3.06	3.56	3.54	2.54
Use maps	3.18	3.61	4.17	3.98	3.07
Protect against NBC hazards	3.07	3.21	4.49	4.10	3.21
Monitor/inspect	3.05	2.96	3.32	3.30	2.72
Train	2.97	3.29	3.50	3.50	2.78
Fire individual weapons	2.96	2.65	4.41	4.00	2.77
Counsel	2.92	2.77	3.34	3.42	2.85
Perform op chcks/svcs on weap	2.81	2.78	4.21	3.86	2.55
Install wire/cables	2.78	3.21	2.37	2.94	2.28
Give directions/instructions	2.76	2.94	3.20	3.24	2.32
Prep technical forms/documents	2.71	2.80	2.03	2.73	2.32
Place/camoufl tact equip/mater	2.47	2.53	3.09	2.92	2.19
Order equipment/supplies	2.42	2.46	2.21	2.42	2.00
Pack/load materials	2.42	2.48	2.46	2.72	2.40
Navigate	2.36	2.86	3.86	3.61	3.22
Give first aid	2.35	2.59	4.09	3.75	3.13
Give short oral reports	2.30	2.38	3.09	2.94	2.34
Analyze electronic signals	2.27	2.76	1.80	2.44	3.02
Inspect electrical systems	2.25	2.89	1.67	2.51	2.69
Plan placement/use tact equip	2.19	2.77	2.76	2.85	2.48
Personnel Administration	2.13	2.16	2.48	2.46	1.93
Inspect electronic systems	2.05	2.73	1.39	2.34	2.55
Paint	1.96	1.36	1.64	1.76	1.32
Move/react in the field	1.85	1.84	3.24	2.97	2.44
Sketch maps/overlays/range cards	1.77	1.94	2.78	2.59	2.56
Control individuals/crowds	1.68	1.16	2.05	1.89	1.72
Provide counseling	1.65	1.78	1.91	2.02	1.63
Know customs/laws of war	1.63	1.60	2.93	2.71	2.14
Use hand & arm signals	1.52	1.54	2.04	1.97	1.42

(table continues)

Table B.5 (continued)

Task Categories	Rating FRE N=76	CTI N=76	GSI N=76	OJI N=76	DIF N=76
Record/file/dispatch information	1.50	1.52	1.21	1.46	1.26
Conduct land surveys	1.50	1.78	2.03	2.01	1.67
Plan operations	1.47	1.73	1.98	2.05	1.98
Operate computer hardware	1.42	1.60	1.03	1.53	1.72
Direct/lead teams	1.38	1.68	2.17	2.18	2.18
Analyze weather conditions	1.31	1.62	1.48	1.57	1.50
Troubleshoot mechanical systems	1.28	1.65	1.42	1.66	2.08
Detect/identify targets	1.28	1.38	2.59	2.39	2.40
Repair mechanical systems	1.15	1.59	1.30	1.63	2.03
Use hand grenades	1.14	1.20	2.78	2.36	1.78
Operate track vehicle	1.14	1.07	1.10	1.18	1.28
Repair electrical systems	1.05	1.61	0.92	1.48	1.97
Assemble steel structures	1.02	1.10	0.75	1.02	0.84
Troubleshoot weapons	0.97	1.19	1.69	1.61	1.42
Write documents/correspondence	0.96	1.15	0.94	1.14	1.25
Repair electronic components	0.81	1.32	0.85	1.23	1.54
Compute statistics/other math	0.81	1.21	0.86	1.14	1.31
Receive/store/issue supp/equip	0.78	0.88	0.84	0.97	0.80
Engage in hand-to-hand combat	0.76	0.60	1.53	1.32	1.46
Reproduce printed material	0.72	0.70	0.62	0.73	0.66
Write/deliver presentations	0.57	0.65	0.72	0.78	0.84
Use audiovisual equipment	0.50	0.54	0.54	0.61	0.55
Handle demolitions/mines	0.42	0.34	0.88	0.81	0.90
Draw maps/overlays	0.40	0.46	0.52	0.53	0.46
Prep equip/supplies for air drop	0.34	0.52	0.42	0.49	0.68
Analyze intelligence data	0.32	0.51	0.48	0.53	0.64
Estimate time/cost of maint ops	0.32	0.40	0.29	0.41	0.40
Repair weapons	0.28	0.44	0.61	0.61	0.65
Repair metal	0.28	0.30	0.27	0.30	0.50
Provide programming/DP support	0.27	0.28	0.26	0.30	0.39
Draw illustrations	0.26	0.32	0.32	0.31	0.30
Receive clients/patients/guests	0.25	0.22	0.23	0.23	0.21
Repair plastic/fiberglass	0.19	0.15	0.15	0.17	0.23
Prepare parachutes	0.17	0.25	0.22	0.23	0.36
Control money	0.15	0.15	0.15	0.15	0.22
Operate radar	0.14	0.10	0.10	0.13	0.25
Determine fire data-indirect weap	0.13	0.18	0.23	0.21	0.34
Translate foreign languages	0.11	0.11	0.10	0.07	0.30
Produce technical drawings	0.10	0.13	0.10	0.10	0.11
Interview	0.10	0.13	0.19	0.17	0.21
Construct wooden bldgs/struct	0.10	0.09	0.06	0.09	0.18
Cook	0.09	0.06	0.09	0.09	0.14
Provide medical/dental treatment	0.09	0.15	0.25	0.22	0.21
Operate lift/load/grade equip	0.07	0.06	0.07	0.10	0.17

(table continues)

Table B.5 (continued)

Task Categories	Rating FRE N=76	CTI N=76	GSI N=76	OJI N=76	DIF N=76
Fire indirect fire weapons	0.07	0.09	0.09	0.07	0.11
Control air traffic	0.06	0.11	0.09	0.10	0.15
Install pipe assemblies	0.05	0.03	0.02	0.03	0.11
Perform medical lab procedures	0.05	0.05	0.06	0.06	0.09
Load/unload artillery/tank guns	0.03	0.07	0.07	0.06	0.07
Operate power excavating equip	0.03	0.01	0.02	0.03	0.09
Construct masonry bldgs/struct	0.03	0.02	0.02	0.02	0.09
Fire heavy direct fire weapons	0.02	0.03	0.05	0.05	0.07
Select/lay/clean med/dent equip	0.02	0.03	0.02	0.03	0.02
Operate boats	0.02	0.01	0.02	0.02	0.07
Prep heavy weap for tactical use	0.01	0.01	0.01	0.01	0.02

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.6

Army Task Questionnaire Mean Ratings: 31D - Mobile Subscriber Equipment Transmission System Operator

Task Categories	Rating FRE N=17	CTI N=17	GSI N=17	OJI N=17	DIF N=17
Operate electronic equipment	4.70	4.58	2.88	3.82	3.17
Install electronic components	4.47	4.29	2.70	3.64	3.23
Perform op maint chcks/svcs	4.35	4.17	3.76	4.35	2.17
Read tech manl/field manl/etc	4.23	4.35	3.52	4.05	2.47
Install wire/cables	4.05	3.93	2.37	3.12	2.00
Send/receive radio messages	4.05	4.35	3.35	3.88	2.64
Operate wheeled vehicle	3.70	3.76	3.23	3.58	1.76
Act as a model	3.70	3.47	4.00	4.00	2.88
Lead	3.47	3.76	3.70	3.58	2.88
Communicate	3.41	3.35	3.58	3.58	2.52
Operate gas/electric power equip	3.29	3.05	2.29	2.58	2.00
Counsel	3.29	3.50	3.68	3.81	2.93
Place/camoufl tact equip/mater	3.25	3.25	3.56	3.50	1.87
Give directions/instructions	3.11	2.93	2.18	2.75	1.87
Use maps	3.11	3.88	3.82	4.11	2.82
Train	3.11	3.52	3.35	3.47	2.64
Monitor/inspect	3.00	3.11	3.11	3.11	2.29
Inspect electrical systems	2.35	2.76	2.05	2.47	2.05
Personnel Administration	2.35	2.11	2.35	2.64	1.88
Inspect electronic systems	2.17	2.41	1.70	2.23	2.05
Give short oral reports	2.11	2.11	2.11	2.47	1.76
Survive in the field	2.11	2.75	3.52	3.23	2.29
Decode data	2.00	2.23	2.11	2.47	2.05
Provide counseling	1.94	2.00	2.00	2.35	1.82
Prep technical forms/documents	1.94	2.00	1.88	2.23	1.35
Plan placement/use tact equip	1.94	2.06	1.31	1.81	1.62
Order equipment/supplies	1.94	1.94	1.70	2.05	1.76
Assemble steel structures	1.94	1.94	0.94	1.64	1.35
Pack/load materials	1.94	1.70	1.41	1.64	1.58
Troubleshoot mechanical systems	1.88	2.11	1.88	2.17	2.11
Plan operations	1.82	2.05	1.88	2.29	1.82
Protect against NBC hazards	1.82	2.17	3.52	3.11	2.37
Give first aid	1.82	1.93	3.47	2.88	2.12
Fire individual weapons	1.64	1.23	3.07	2.64	2.07
Navigate	1.58	1.88	2.64	2.47	2.35
Use hand & arm signals	1.52	1.58	1.47	1.64	1.05
Perform op chcks/svcs on weap	1.52	1.41	2.82	2.76	1.82
Know customs/laws of war	1.35	1.25	2.35	2.11	1.75
Paint	1.35	1.11	0.58	1.00	0.88
Conduct land surveys	1.35	1.02	2.23	2.05	1.52
Control individuals/crowds	1.29	1.06	2.05	1.88	1.52

(table continues)

Table B.6 (continued)

Task Categories	Rating FRE N=17	CTI N=17	GSI N=17	OJI N=17	DIF N=17
Type	1.11	1.00	0.94	1.05	1.00
Analyze weather conditions	1.11	1.35	1.29	1.35	1.41
Operate computer hardware	1.05	1.05	0.70	0.94	1.58
Direct/lead teams	1.05	1.11	1.17	1.23	1.00
Repair mechanical systems	1.05	1.29	1.41	1.47	1.94
Analyze electronic signals	1.00	1.88	1.23	1.23	1.94
Record/file/dispatch information	0.94	1.00	0.94	1.05	0.64
Repair electrical systems	0.94	1.58	1.17	1.29	1.76
Write/deliver presentations	0.88	0.43	0.37	0.43	0.75
Use hand grenades	0.76	0.62	2.23	1.88	1.25
Move/react in the field	0.76	0.87	1.88	1.52	1.41
Repair electronic components	0.76	1.47	1.00	1.17	1.58
Receive/store/issue supp/equip	0.64	0.64	0.70	0.70	0.70
Troubleshoot weapons	0.64	0.47	1.00	1.00	0.58
Reproduce printed material	0.58	0.64	0.82	0.82	0.88
Engage in hand-to-hand combat	0.52	0.43	1.52	1.11	1.47
Repair weapons	0.47	0.29	0.64	0.52	0.52
Write documents/correspondence	0.47	0.58	0.58	0.58	0.47
Analyze intelligence data	0.43	0.75	0.81	0.81	0.81
Estimate time/cost of maint ops	0.41	0.35	0.47	0.41	0.52
Control money	0.35	0.05	0.11	0.29	0.17
Interview	0.35	0.35	0.35	0.47	0.52
Sketch maps/overlays/range cards	0.29	0.41	0.82	0.82	0.64
Detect/identify targets	0.29	0.11	0.64	0.47	0.52
Draw illustrations	0.17	0.47	0.41	0.47	0.47
Prep equip/supplies for air drop	0.17	0.17	0.23	0.23	0.41
Translate foreign languages	0.11	0.11	0.11	0.17	0.17
Provide medical/dental treatment	0.11	0.11	0.23	0.17	0.11
Construct wooden bldgs/struct	0.11	0.11	0.17	0.11	0.41
Receive clients/patients/guests	0.05	0.05	0.05	0.05	0.05
Handle demolitions/mines	0.05	0.11	0.23	0.11	0.23
Cook	0.05	0.11	0.05	0.05	0.05
Perform medical lab procedures	0.05	0.05	0.05	0.05	0.05
Repair plastic/fiberglass	0.05	0.05	0.11	0.11	0.23
Compute statistics/other math	0.05	0.05	0.05	0.05	0.23
Repair metal	0.05	0.05	0.11	0.11	0.23
Construct masonry bldgs/struct	0.05	0.05	0.05	0.05	0.11
Prepare parachutes	0.05	0.05	0.05	0.11	0.23
Draw maps/overlays	0.05	0.05	0.11	0.11	0.17
Operate power excavating equip	0.00	0.00	0.00	0.00	0.00
Fire heavy direct fire weapons	0.00	0.00	0.00	0.00	0.00
Operate track vehicle	0.00	0.00	0.00	0.00	0.00
Determine fire data-indirect weap	0.00	0.00	0.00	0.00	0.00

(table continues)

Table B.6 (continued)

Task Categories	Rating FRE N=17	CTI N=17	GSI N=17	OJI N=17	DIF N=17
Provide programming/DP support	0.00	0.00	0.00	0.00	0.00
Control air traffic	0.00	0.00	0.00	0.00	0.00
Prep heavy weap for tactical use	0.00	0.00	0.00	0.00	0.00
Load/unload artillery/tank guns	0.00	0.00	0.00	0.00	0.00
Fire indirect fire weapons	0.00	0.00	0.00	0.00	0.00
Produce technical drawings	0.00	0.00	0.00	0.00	0.00
Operate lift/load/grade equip	0.00	0.00	0.00	0.00	0.00
Operate boats	0.00	0.00	0.00	0.00	0.00
Install pipe assemblies	0.00	0.00	0.00	0.00	0.00
Select/lay/clean med/dent equip	0.00	0.00	0.00	0.00	0.00
Operate radar	0.00	0.00	0.00	0.00	0.00
Use audiovisual equipment	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.7

Army Task Questionnaire Mean Ratings: 51B - Carpentry and Masonry Specialist

Task Categories	Rating FRE N=80	CTI N=80	GSI N=80	OJI N=80	DIF N=79
Construct wooden bldgs/struct	4.26	4.74	2.10	4.48	3.84
Construct masonry bldgs/struct	3.92	4.58	2.02	4.25	4.11
Perform op maint chcks/svcs	3.78	3.47	3.77	4.00	2.98
Operate wheeled vehicle	3.73	3.40	3.52	3.82	2.74
Paint	3.20	3.17	1.58	2.86	2.10
Read tech manl/field manl/etc	3.00	3.58	3.45	3.56	2.82
Act as a model	2.97	3.17	3.78	3.67	2.93
Protect against NBC hazards	2.95	2.16	4.23	4.02	3.24
Fire individual weapons	2.91	2.34	4.35	4.00	2.83
Operate gas/electric power equip	2.70	3.25	2.07	3.16	2.93
Perform op chcks/svcs on weap	2.68	2.55	4.18	3.85	3.01
Communicate	2.67	2.67	3.24	3.21	2.48
Operate power excavating equip	2.67	3.17	1.63	2.98	2.94
Give directions/instructions	2.62	2.97	3.24	3.25	2.55
Use maps	2.48	2.47	3.78	3.58	3.16
Survive in the field	2.45	2.25	3.93	3.76	3.06
Lead	2.42	2.78	3.07	3.07	2.86
Give first aid	2.35	2.51	4.22	3.90	3.40
Handle demolitions/mines	2.30	2.61	3.11	3.30	3.57
Counsel	2.27	2.12	2.79	2.77	2.48
Place/camoufl tact equip/mater	2.22	2.15	3.52	3.47	2.86
Send/receive radio messages	1.97	1.90	3.22	3.02	2.62
Train	1.96	2.17	2.42	2.50	2.16
Assemble steel structures	1.91	2.84	1.53	2.60	3.29
Move/react in the field	1.91	1.75	3.53	3.32	2.83
Pack/load materials	1.87	2.06	2.22	2.45	2.50
Sketch maps/overlays/range cards	1.82	1.67	2.66	2.48	2.55
Monitor/inspect	1.81	2.28	2.37	2.41	2.10
Control individuals/crowds	1.73	1.20	2.46	2.42	2.01
Navigate	1.73	1.86	3.21	3.12	3.00
Install pipe assemblies	1.67	2.31	1.08	2.22	2.79
Use hand & arm signals	1.65	1.93	2.43	2.28	1.78
Give short oral reports	1.63	1.91	2.72	2.67	2.24
Compute statistics/other math	1.63	2.28	1.36	2.06	2.25
Install wire/cables	1.51	1.83	1.22	1.91	1.93
Personnel Administration	1.47	1.52	1.76	1.78	1.70
Know customs/laws of war	1.47	1.30	2.74	2.54	2.26
Use hand grenades	1.46	1.15	3.15	2.79	2.19
Repair mechanical systems	1.35	1.60	1.56	1.87	1.98
Detect/identify targets	1.28	1.15	2.62	2.32	2.43
Repair metal	1.25	1.67	0.58	1.47	2.15

(table continues)

Table B.7 (continued)

Task Categories	Rating FRE N=80	CTI N=80	GSI N=80	OJI N=80	DIF N=79
Order equipment/supplies	1.22	1.73	1.31	1.63	1.87
Direct/lead teams	1.03	1.36	1.82	1.86	1.79
Receive/store/issue supp/equip	1.00	1.31	0.91	1.32	1.26
Repair plastic/fiberglass	0.97	1.18	0.43	1.10	1.38
Provide counseling	0.92	0.90	1.33	1.31	1.21
Plan operations	0.92	1.41	1.47	1.57	1.59
Troubleshoot weapons	0.88	1.02	1.48	1.42	1.39
Conduct land surveys	0.87	1.26	1.28	1.32	1.78
Install electronic components	0.87	0.95	1.22	1.26	1.57
Plan placement/use tact equip	0.83	0.86	1.36	1.27	1.35
Prepare tech forms/documents	0.81	0.87	0.80	0.98	0.88
Engage in hand-to-hand combat	0.80	0.69	1.82	1.63	1.91
Draw illustrations	0.76	1.23	0.68	1.10	1.22
Decode data	0.75	0.68	1.32	1.31	1.70
Repair electrical systems	0.71	1.00	0.56	0.92	1.25
Inspect electrical systems	0.71	0.98	0.60	0.91	1.32
Troubleshoot mechanical systems	0.70	0.96	0.95	1.00	1.38
Record/file/dispatch information	0.67	0.57	0.65	0.72	0.78
Produce technical drawings	0.61	0.93	0.35	0.85	1.17
Operate electronic equipment	0.58	0.73	1.03	0.96	1.08
Operate lift/load/grade equip	0.53	0.63	0.32	0.61	0.96
Reproduce printed material	0.45	0.30	0.26	0.30	0.31
Type	0.45	0.37	0.37	0.40	0.78
Estimate time/cost of maint ops	0.39	0.55	0.47	0.56	0.67
Write documents/correspondence	0.37	0.60	0.56	0.65	0.72
Analyze weather conditions	0.35	0.48	0.50	0.57	0.53
Draw maps/overlays	0.33	0.33	0.41	0.45	0.62
Repair weapons	0.30	0.23	0.63	0.61	0.58
Write/deliver presentations	0.27	0.35	0.35	0.41	0.51
Repair electronic components	0.27	0.31	0.21	0.36	0.45
Determine fire data-indirect weap	0.22	0.22	0.35	0.33	0.46
Control money	0.21	0.22	0.18	0.21	0.26
Use audiovisual equipment	0.18	0.17	0.20	0.25	0.32
Inspect electronic systems	0.16	0.21	0.11	0.20	0.30
Operate computer hardware	0.16	0.13	0.13	0.13	0.29
Operate track vehicle	0.12	0.15	0.15	0.15	0.20
Interview	0.11	0.12	0.13	0.13	0.16
Analyze intelligence data	0.11	0.12	0.22	0.21	0.29
Prep equip/supplies for air drop	0.10	0.06	0.11	0.07	0.25
Provide programming/DP support	0.07	0.10	0.03	0.07	0.13
Operate boats	0.07	0.08	0.08	0.10	0.17
Receive clients/patients/guests	0.06	0.10	0.10	0.11	0.03
Load/unload artillery/tank guns	0.06	0.03	0.02	0.02	0.08
Analyze electronic signals	0.06	0.03	0.12	0.11	0.13

(table continues)

Table B.7 (continued)

Task Categories	Rating FRE N=80	CTI N=80	GSI N=80	OJI N=80	DIF N=79
Cook	0.05	0.05	0.07	0.06	0.06
Fire indirect fire weapons	0.05	0.05	0.05	0.05	0.02
Provide medical/dental treatment	0.03	0.05	0.12	0.11	0.11
Translate foreign languages	0.03	0.07	0.05	0.07	0.07
Perform medical lab procedures	0.03	0.03	0.05	0.06	0.01
Prep heavy weap for tactical use	0.02	0.02	0.03	0.02	0.03
Prepare parachutes	0.02	0.00	0.01	0.00	0.03
Control air traffic	0.00	0.00	0.00	0.00	0.00
Fire heavy direct fire weapons	0.00	0.00	0.00	0.00	0.00
Operate radar	0.00	0.00	0.00	0.00	0.00
Select/lay/clean med/dent equip	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.8

Army Task Questionnaire Mean Ratings: 54B - Chemical Operations Specialist

Task Categories	FRE N=67	CTI N=67	GSI N=67	OJI N=67	DIF N=66
	Rating				
Protect against NBC hazards	4.67	4.86	4.57	4.71	3.26
Read tech manl/field manl/etc	4.01	4.25	3.97	4.19	2.53
Perform op maint chcks/svcs	3.88	4.16	4.07	4.28	2.89
Operate wheeled vehicle	3.67	3.68	3.53	3.92	2.40
Use maps	3.56	4.20	4.22	4.23	3.09
Operate gas/electric power equip	3.46	3.83	2.42	3.36	2.87
Survive in the field	3.25	3.58	4.14	4.06	3.22
Send/receive radio messages	3.17	3.70	3.91	3.86	2.81
Fire individual weapons	3.06	3.09	4.12	3.89	2.59
Act as a model	3.01	2.97	3.40	3.42	2.83
Place/camoufl tact equip/mater	2.92	3.26	3.58	3.55	2.64
Navigate	2.91	3.52	3.86	3.80	3.34
Give directions/instructions	2.85	3.25	3.17	3.26	2.50
Perform op chcks/svcs on weap	2.82	3.00	4.16	4.10	2.47
Give short oral reports	2.76	2.98	3.10	3.19	2.69
Give first aid	2.76	3.07	4.17	3.88	3.21
Sketch maps/overlays/range cards	2.56	3.04	3.46	3.37	3.04
Train	2.49	3.00	3.01	3.22	2.75
Use hand & arm signals	2.49	2.78	3.10	2.97	2.18
Move/react in the field	2.47	2.38	3.52	3.33	2.67
Monitor/inspect	2.34	3.04	3.00	3.12	2.72
Communicate	2.29	2.77	2.90	2.97	2.31
Know customs/laws of war	2.17	2.09	3.09	2.82	2.31
Lead	2.13	2.73	2.95	2.92	2.72
Order equipment/supplies	2.11	2.50	1.90	2.38	2.12
Pack/load materials	2.06	2.04	2.19	2.43	2.32
Operate electronic equipment	2.03	2.59	2.58	2.70	2.50
Analyze weather conditions	2.00	2.86	1.95	2.41	2.47
Plan placement/use tact equip	1.97	2.44	2.53	2.55	2.28
Operate track vehicle	1.95	2.29	1.86	2.20	2.21
Detect/identify targets	1.94	2.16	3.09	2.83	2.75
Direct/lead teams	1.94	2.68	2.71	2.76	2.83
Repair mechanical systems	1.92	2.46	2.23	2.37	2.56
Compute statistics/other math	1.88	2.65	1.61	2.17	2.59
Prep technical forms/documents	1.85	2.11	1.55	2.10	1.95
Plan operations	1.82	2.37	2.36	2.40	2.49
Paint	1.80	1.18	1.31	1.47	1.09
Record/file/dispatch information	1.77	1.92	1.47	1.92	1.81
Use hand grenades	1.77	1.95	3.37	2.97	1.86
Troubleshoot mechanical systems	1.76	1.98	1.77	1.87	2.36
Decode data	1.74	2.32	2.41	2.41	2.68

(table continues)

Table B.8 (continued)

Task Categories	Rating FRE N=67	CTI N=67	GSI N=67	OJI N=67	DIF N=66
Control individuals/crowds	1.73	1.47	2.25	2.09	1.98
Counsel	1.68	1.92	2.35	2.38	2.16
Receive/store/issue supp/equip	1.61	1.74	1.35	1.67	1.78
Handle demolitions/mines	1.59	2.14	2.14	2.31	2.90
Install electronic components	1.52	1.72	1.86	2.03	1.90
Conduct land surveys	1.38	1.80	1.65	1.74	1.68
Personnel Administration	1.37	1.47	1.64	1.67	1.60
Write/deliver presentations	1.26	1.29	1.14	1.25	1.60
Type	1.23	1.06	1.06	1.28	1.87
Install wire/cables	1.23	1.37	1.39	1.50	1.29
Write documents/correspondence	1.20	1.38	1.25	1.38	1.74
Troubleshoot weapons	1.16	1.49	2.13	1.92	1.72
Engage in hand-to-hand combat	1.13	1.16	2.20	1.98	2.19
Operate computer hardware	0.98	0.83	0.88	1.03	1.75
Provide counseling	0.88	1.10	1.22	1.26	1.09
Draw maps/overlays	0.82	1.03	0.97	1.03	1.01
Reproduce printed material	0.77	0.61	0.61	0.82	0.53
Use audiovisual equipment	0.59	0.59	0.59	0.64	0.57
Prep equip/supplies for air drop	0.58	0.62	0.59	0.74	1.45
Inspect electrical systems	0.46	0.61	0.48	0.62	0.92
Interview	0.43	0.46	0.53	0.52	0.60
Repair weapons	0.41	0.46	0.65	0.64	0.87
Analyze intelligence data	0.41	0.61	0.58	0.59	0.69
Estimate time/cost of maint ops	0.37	0.53	0.50	0.52	0.71
Install pipe assemblies	0.35	0.44	0.16	0.31	0.45
Draw illustrations	0.30	0.42	0.36	0.36	0.50
Repair electrical systems	0.29	0.44	0.37	0.40	0.63
Inspect electronic systems	0.23	0.31	0.25	0.31	0.39
Analyze electronic signals	0.23	0.41	0.38	0.38	0.53
Produce technical drawings	0.22	0.28	0.26	0.25	0.31
Repair electronic components	0.20	0.34	0.26	0.34	0.57
Repair metal	0.20	0.20	0.19	0.23	0.47
Repair plastic/fiberglass	0.16	0.16	0.13	0.15	0.32
Prepare parachutes	0.11	0.13	0.10	0.13	0.28
Determine fire data-indirect weap	0.11	0.28	0.23	0.31	0.33
Operate lift/load/grade equip	0.10	0.13	0.09	0.09	0.25
Assemble steel structures	0.10	0.10	0.20	0.19	0.39
Load/unload artillery/tank guns	0.09	0.00	0.06	0.06	0.04
Control money	0.09	0.04	0.14	0.10	0.12
Prep heavy weap for tactical use	0.07	0.00	0.04	0.04	0.06
Provide programming/DP support	0.06	0.10	0.07	0.07	0.13
Receive clients/patients/guests	0.04	0.07	0.07	0.07	0.07
Fire heavy direct fire weapons	0.04	0.04	0.04	0.04	0.04
Construct wooden bldgs/struct	0.03	0.01	0.03	0.03	0.10

(table continues)

Table B.8 (continued)

Task Categories	Rating FRE N=67	CTI N=67	GSI N=67	OJI N=67	DIF N=66
Operate boats	0.03	0.01	0.01	0.01	0.12
Provide medical/dental treatment	0.01	0.01	0.03	0.01	0.03
Operate radar	0.01	0.01	0.04	0.04	0.06
Select/lay/clean med/dent equip	0.01	0.01	0.01	0.01	0.07
Construct masonry bldgs/struct	0.01	0.04	0.03	0.03	0.04
Translate foreign languages	0.01	0.04	0.04	0.06	0.06
Control air traffic	0.01	0.00	0.03	0.03	0.06
Fire indirect fire weapons	0.00	0.00	0.00	0.00	0.00
Cook	0.00	0.00	0.00	0.00	0.00
Operate power excavating equip	0.00	0.00	0.00	0.00	0.00
Perform medical lab procedures	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.9

Army Task Questionnaire Mean Ratings: 55B - Ammunition Specialist

Task Categories	Rating FRE N=61	CTI N=61	GSI N=61	OJI N=61	DIF N=61
Operate lift/load/grade equip	4.06	4.28	2.68	3.66	3.10
Receive/store/issue supp/equip	4.04	4.16	2.95	3.75	2.88
Perform op maint chcks/svcs	3.67	3.48	3.46	3.54	2.48
Pack/load materials	3.49	3.66	2.73	3.40	2.83
Read tech manl/field manl/etc	3.37	3.57	3.41	3.55	2.51
Operate wheeled vehicle	3.19	3.24	3.29	3.36	2.34
Act as a model	3.08	2.88	3.21	3.00	2.25
Handle demolitions/mines	3.01	3.37	2.63	3.14	2.47
Communicate	3.00	3.00	3.20	3.08	2.26
Lead	2.77	2.70	3.04	2.96	2.39
Counsel	2.72	2.72	3.01	2.89	2.42
Protect against NBC hazards	2.65	3.41	4.18	3.93	2.93
Fire individual weapons	2.63	2.58	3.93	3.56	2.40
Train	2.61	2.70	2.93	2.79	2.15
Perform op chcks/svcs on weap	2.57	2.65	3.96	3.73	2.21
Give directions/instructions	2.53	2.56	2.70	2.70	2.01
Give first aid	2.34	3.01	3.93	3.65	2.75
Prep technical forms/documents	2.31	2.54	1.89	2.35	2.08
Use hand & arm signals	2.29	2.75	2.36	2.60	2.11
Survive in the field	2.23	2.76	3.68	3.35	2.78
Use maps	2.13	2.49	3.27	2.91	2.68
Paint	2.08	2.15	1.55	1.81	1.42
Monitor/inspect	2.01	2.11	2.41	2.23	1.88
Use hand grenades	1.95	2.54	2.95	2.82	2.03
Personnel Administration	1.90	2.06	2.16	2.11	1.86
Record/file/dispatch information	1.81	2.30	1.69	2.03	1.96
Navigate	1.77	2.24	3.08	2.86	2.50
Move/react in the field	1.70	1.90	2.70	2.42	2.13
Control individuals/crowds	1.68	1.70	2.08	2.08	1.73
Send/receive radio messages	1.67	2.23	2.73	2.57	2.16
Operate gas/electric power equip	1.57	1.80	1.88	1.93	1.98
Detect/identify targets	1.57	1.83	2.39	2.19	2.04
Plan operations	1.55	1.83	1.88	1.91	1.88
Place/camoufl tact equip/mater	1.50	1.82	2.52	2.19	1.93
Know customs/laws of war	1.49	1.78	2.36	2.16	1.91
Provide counseling	1.47	1.44	1.68	1.63	1.36
Compute statistics/other math	1.32	1.47	1.18	1.37	1.09
Direct/lead teams	1.31	1.44	1.90	1.70	1.73
Sketch maps/overlays/range cards	1.26	1.50	2.28	2.03	2.21
Give short oral reports	1.23	1.41	2.03	1.96	1.62
Order equipment/supplies	1.21	1.42	1.26	1.39	1.52
Plan placement/use tact equip	1.11	1.21	1.50	1.42	1.54

(table continues)

Table B.9 (continued)

Task Categories	Rating FRE N=61	CTI N=61	GSI N=61	OJI N=61	DIF N=61
Prep equip/supplies for air drop	1.04	1.74	1.31	1.65	2.01
Type	1.00	1.21	0.88	1.16	1.57
Reproduce printed material	0.90	0.63	0.72	0.77	0.72
Engage in hand-to-hand combat	0.88	0.95	1.41	1.18	1.43
Operate computer hardware	0.76	0.74	0.55	0.75	1.01
Write documents/correspondence	0.72	0.75	0.82	0.91	0.93
Repair mechanical systems	0.68	0.75	0.72	0.83	1.16
Troubleshoot weapons	0.67	0.95	1.11	1.27	1.13
Operate electronic equipment	0.65	0.80	0.96	0.90	1.05
Conduct land surveys	0.63	0.91	1.01	1.00	1.13
Use audiovisual equipment	0.63	0.60	0.60	0.63	0.72
Construct wooden bldgs/struct	0.59	0.54	0.41	0.45	0.73
Decode data	0.57	0.68	0.96	0.98	1.00
Troubleshoot mechanical systems	0.55	0.68	0.78	0.68	0.93
Install wire/cables	0.44	0.55	0.51	0.54	0.48
Load/unload artillery/tank guns	0.42	0.51	0.38	0.45	0.43
Repair weapons	0.42	0.55	0.63	0.70	0.65
Write/deliver presentations	0.41	0.60	0.62	0.65	0.80
Install electronic components	0.39	0.42	0.50	0.54	0.67
Provide programming/DP support	0.39	0.45	0.36	0.52	0.83
Inspect electrical systems	0.34	0.32	0.39	0.39	0.49
Determine fire data-indirect weap	0.31	0.47	0.47	0.47	0.62
Draw maps/overlays	0.31	0.41	0.43	0.38	0.68
Operate track vehicle	0.31	0.34	0.26	0.32	0.54
Estimate time/cost of maint ops	0.29	0.34	0.27	0.31	0.37
Control money	0.27	0.37	0.34	0.36	0.44
Fire indirect fire weapons	0.27	0.34	0.34	0.32	0.39
Repair metal	0.27	0.24	0.24	0.24	0.32
Draw illustrations	0.26	0.34	0.36	0.34	0.41
Interview	0.26	0.38	0.38	0.41	0.42
Operate power excavating equip	0.24	0.27	0.29	0.29	0.31
Prepare parachutes	0.24	0.29	0.23	0.31	0.44
Analyze weather conditions	0.24	0.32	0.29	0.29	0.29
Produce technical drawings	0.24	0.26	0.29	0.26	0.36
Receive clients/patients/guests	0.21	0.23	0.23	0.31	0.19
Translate foreign languages	0.19	0.23	0.16	0.24	0.50
Repair electrical systems	0.18	0.32	0.27	0.39	0.49
Inspect electronic systems	0.16	0.23	0.27	0.23	0.39
Cook	0.16	0.19	0.18	0.21	0.18
Analyze intelligence data	0.16	0.19	0.31	0.24	0.32
Repair plastic/fiberglass	0.16	0.13	0.06	0.08	0.16
Control air traffic	0.14	0.27	0.21	0.23	0.29
Repair electronic components	0.14	0.21	0.23	0.27	0.44
Assemble steel structures	0.14	0.16	0.13	0.18	0.21

(table continues)

Table B.9 (continued)

Task Categories	Rating FRE N=61	CTI N=61	GSI N=61	OJI N=61	DIF N=61
Fire heavy direct fire weapons	0.14	0.18	0.16	0.18	0.32
Operate radar	0.13	0.18	0.19	0.21	0.23
Install pipe assemblies	0.11	0.16	0.09	0.13	0.24
Provide medical/dental treatment	0.11	0.16	0.16	0.16	0.14
Perform medical lab procedures	0.11	0.18	0.06	0.14	0.16
Prep heavy weap for tactical use	0.11	0.11	0.09	0.09	0.09
Analyze electronic signals	0.09	0.11	0.09	0.13	0.11
Operate boats	0.06	0.09	0.09	0.08	0.23
Construct masonry bldgs/struct	0.04	0.09	0.04	0.04	0.08
Select/lay/clean med/dent equip	0.03	0.06	0.04	0.03	0.03

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.10

Army Task Questionnaire Mean Ratings: 95B - Military Police

Task Categories	Rating FRE N=75	CTI N=75	GSI N=75	OJI N=75	DIF N=74
Send/receive radio messages	4.44	4.46	4.05	4.30	3.00
Operate wheeled vehicle	4.38	4.38	3.62	4.09	2.64
Control individuals/crowds	4.12	4.37	3.00	3.78	3.35
Give directions/instructions	4.09	4.08	3.04	3.69	2.55
Perform op chcks/svcs on weap	3.98	4.20	4.45	4.43	2.71
Fire individual weapons	3.97	4.54	4.50	4.54	3.24
Interview	3.97	4.37	2.55	3.68	3.45
Use maps	3.94	4.38	4.26	4.36	3.39
Act as a model	3.92	4.26	3.68	3.97	3.35
Perform op maint chcks/svcs	3.80	3.74	4.01	4.01	2.41
Navigate	3.73	4.37	3.98	4.12	3.54
Customs/laws of war	3.70	4.02	3.32	3.73	3.00
Give short oral reports	3.66	3.92	3.69	3.77	2.98
Survive in the field	3.64	4.25	4.29	4.21	3.44
Use hand & arm signals	3.48	3.83	3.33	3.70	2.56
Read tech manl/field manl/etc	3.45	3.45	3.23	3.39	2.39
Protect against NBC hazards	3.42	3.90	4.31	4.20	3.35
Give first aid	3.42	4.26	4.10	4.13	3.45
Prep technical forms/documents	3.32	3.45	2.02	2.86	2.91
Sketch maps/overlays/range cards	3.30	3.70	3.53	3.61	3.29
Communicate	3.29	3.65	3.25	3.48	2.89
Move/react in the field	3.17	3.66	4.02	3.94	3.34
Lead	3.13	3.62	3.36	3.45	3.16
Counsel	3.00	3.10	2.85	3.00	2.87
Detect/identify targets	2.80	3.37	3.50	3.45	3.43
Monitor/inspect	2.76	3.08	2.78	2.88	2.71
Engage in hand-to-hand combat	2.76	3.69	3.16	3.48	3.47
Provide counseling	2.74	3.09	2.01	2.72	2.75
Train	2.74	3.09	2.89	3.01	2.77
Write documents/correspondence	2.62	2.88	1.73	2.57	2.77
Decode data	2.58	3.28	3.20	3.17	3.41
Place/camoufl tact equip/mater	2.41	2.90	3.13	3.01	2.58
Direct/lead teams	2.40	3.06	2.88	2.94	3.13
Plan placement/use tact equip	2.33	2.80	2.88	2.89	2.78
Record/file/dispatch information	2.29	2.34	1.61	2.20	2.13
Operate electronic equipment	2.25	2.60	2.28	2.56	2.16
Type	2.25	2.20	1.50	2.01	2.86
Use hand grenades	2.17	2.68	3.26	2.97	2.08
Personnel Administration	2.13	2.29	2.13	2.24	2.09
Plan operations	2.04	2.54	2.37	2.44	2.86
Install electronic components	1.93	2.32	2.30	2.36	2.25
Pack/load materials	1.92	2.01	2.06	2.10	2.34

(table continues)

Table B.10 (continued)

Task Categories	FRE N=75	CTI N=75	GSI N=75	OJI N=75	DIF N=74
	Rating				
Conduct land surveys	1.48	1.62	1.65	1.76	1.71
Paint	1.37	0.77	1.10	1.17	0.91
Operate computer hardware	1.36	1.48	1.04	1.45	2.52
Handle demolitions/mines	1.33	1.64	1.90	1.86	2.31
Operate gas/electric power equip	1.18	1.42	1.41	1.45	2.06
Analyze intelligence data	1.12	1.45	1.23	1.36	1.76
Write/deliver presentations	1.10	1.22	0.89	1.18	1.64
Use audiovisual equipment	1.02	1.04	0.78	1.00	1.45
Install wire/cables	0.97	1.21	1.29	1.29	1.12
Reproduce printed material	0.97	0.74	0.60	0.72	0.77
Order equipment/supplies	0.90	0.98	0.88	1.01	1.08
Troubleshoot weapons	0.89	1.40	1.48	1.44	1.56
Operate radar	0.86	0.94	0.36	0.78	1.02
Receive clients/patients/guests	0.81	0.85	0.56	0.84	0.64
Repair mechanical systems	0.80	0.86	1.04	1.05	1.47
Analyze weather conditions	0.78	0.88	0.76	0.81	1.04
Receive/store/issue supp/equip	0.78	0.85	0.84	0.84	1.05
Compute statistics/other math	0.78	0.96	0.73	0.94	1.58
Draw maps/overlays	0.74	0.93	0.81	0.93	1.02
Determine fire data-indirect weap	0.65	0.93	0.94	0.96	1.25
Analyze electronic signals	0.49	0.80	0.77	0.81	0.95
Translate foreign languages	0.48	0.61	0.40	0.56	1.32
Draw illustrations	0.48	0.58	0.36	0.54	0.75
Repair weapons	0.44	0.70	0.73	0.77	0.97
Troubleshoot mechanical systems	0.34	0.48	0.58	0.58	0.71
Control money	0.25	0.21	0.26	0.33	0.35
Operate boats	0.24	0.36	0.24	0.37	0.70
Operate track vehicle	0.24	0.34	0.30	0.37	0.60
Inspect electrical systems	0.24	0.22	0.24	0.28	0.43
Prep equip/supplies for air drop	0.22	0.38	0.32	0.35	0.66
Inspect electronic systems	0.21	0.20	0.18	0.18	0.39
Estimate time/cost of maint ops	0.18	0.24	0.20	0.25	0.36
Repair electrical systems	0.17	0.21	0.21	0.24	0.39
Assemble steel structures	0.16	0.20	0.26	0.24	0.28
Control air traffic	0.14	0.18	0.25	0.22	0.40
Repair metal	0.14	0.14	0.22	0.18	0.28
Fire indirect fire weapons	0.14	0.14	0.17	0.18	0.24
Produce technical drawings	0.13	0.20	0.10	0.17	0.27
Repair electronic components	0.13	0.14	0.14	0.17	0.32
Provide programming/DP support	0.12	0.18	0.09	0.16	0.36
Provide medical/dental treatment	0.10	0.22	0.22	0.22	0.20
Operate power excavating equip	0.09	0.05	0.06	0.06	0.13
Construct wooden bldgs/struct	0.08	0.12	0.14	0.14	0.23
Prepare parachutes	0.08	0.08	0.05	0.06	0.17

(*table continues*)

Table B.10 (continued)

Task Categories	Rating FRE N=75	CTI N=75	GSI N=75	OJI N=75	DIF N=74
Repair plastic/fiberglass	0.06	0.02	0.06	0.05	0.21
Fire heavy direct fire weapons	0.05	0.09	0.09	0.12	0.18
Load/unload artillery/tank guns	0.02	0.02	0.05	0.05	0.04
Cook	0.02	0.05	0.08	0.08	0.06
Operate lift/load/grade equip	0.02	0.02	0.05	0.04	0.08
Construct masonry bldgs/struct	0.02	0.02	0.02	0.02	0.09
Install pipe assemblies	0.02	0.02	0.02	0.04	0.08
Prep heavy weap for tactical use	0.01	0.02	0.02	0.02	0.02
Perform medical lab procedures	0.00	0.00	0.00	0.00	0.00
Select/lay/clean med/dent equip	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Table B.11

Army Task Questionnaire Mean Ratings: 96B - Intelligence Analyst

Task Categories	Rating FRE N=60	CTI N=60	GSI N=60	OJI N=60	DIF N=59
Use maps	4.30	4.66	4.06	4.43	3.01
Analyze intelligence data	4.10	4.85	2.75	4.31	4.16
Type	3.56	3.48	2.03	3.18	2.70
Give short oral reports	3.53	4.06	3.51	3.95	2.91
Read tech manl/field manl/etc	3.38	3.90	3.50	3.70	2.74
Record/file/dispatch information	3.30	3.41	2.18	3.11	2.59
Send/receive radio messages	3.26	3.76	3.88	3.93	2.61
Communicate	3.25	3.55	3.71	3.80	2.81
Act as a model	3.23	3.13	4.01	3.91	3.30
Sketch maps/overlays/range cards	3.18	3.81	3.18	3.63	3.03
Operate computer hardware	3.13	3.30	2.00	3.06	3.24
Prep technical forms/documents	3.00	3.16	2.31	2.98	2.69
Write/deliver presentations	2.91	4.00	2.43	3.55	3.59
Operate wheeled vehicle	2.91	1.93	3.61	3.46	2.34
Write documents/correspondence	2.88	3.67	2.35	3.32	3.31
Give directions/instructions	2.85	3.30	3.38	3.41	2.59
Lead	2.70	3.06	3.83	3.58	3.30
Analyze weather conditions	2.68	3.40	2.38	3.06	2.96
Perform op maint chcks/svcs	2.65	1.60	3.55	3.31	2.37
Operate electronic equipment	2.63	2.81	2.70	3.06	2.89
Counsel	2.56	2.53	3.36	3.26	2.96
Reproduce printed material	2.51	2.15	1.47	2.08	1.27
Decode data	2.40	2.83	2.98	3.11	3.03
Train	2.33	2.93	3.35	3.33	2.83
Personnel Administration	2.28	2.25	2.73	2.76	2.37
Monitor/inspect	2.21	2.28	2.93	2.80	2.49
Protect against NBC hazards	2.16	1.81	4.13	3.73	2.71
Fire individual weapons	2.11	1.60	4.45	3.73	2.62
Draw maps/overlays	2.03	2.41	1.58	2.00	2.27
Perform op chcks/svcs on weap	1.98	1.67	4.11	3.72	2.38
Survive in the field	1.91	2.01	3.88	3.44	2.70
Use audiovisual equipment	1.78	2.20	1.40	1.96	2.00
Navigate	1.78	1.96	3.53	3.08	2.93
Give first aid	1.71	1.30	4.00	3.47	3.15
Plan placement/use tact equip	1.71	1.98	2.31	2.11	2.27
Know customs/laws of war	1.66	1.56	2.83	2.51	2.39
Detect/identify targets	1.58	2.30	3.01	3.03	2.71
Install electronic components	1.56	1.81	2.41	2.51	2.23
Place/camoufl tact equip/mater	1.53	1.03	2.48	2.20	1.76
Operate track vehicle	1.53	1.23	2.10	1.98	1.96
Pack/load materials	1.48	1.03	1.96	1.83	2.00
Move/react in the field	1.41	1.20	3.20	2.65	2.50

(table continues)

Table B.11 (continued)

Task Categories	FRE N=60	CTI N=60	GSI N=60	OJI N=60	DIF N=59
	Rating				
Order equipment/supplies	1.31	1.32	1.83	1.89	1.65
Plan operations	1.28	1.65	1.86	1.88	2.22
Operate gas/electric power equip	1.26	0.81	1.65	1.63	2.00
Control individuals/crowds	1.21	0.93	2.36	2.11	1.79
Interview	1.21	1.66	1.23	1.50	1.86
Compute statistics/other math	1.20	1.61	1.03	1.43	1.94
Receive/store/issue supp/equip	1.18	1.00	1.26	1.25	1.20
Provide counseling	1.15	1.21	1.70	1.65	1.84
Conduct land surveys	0.98	1.28	1.25	1.33	1.33
Use hand grenades	0.91	0.68	2.51	2.03	1.42
Paint	0.91	0.13	0.73	0.65	0.67
Use hand & arm signals	0.86	0.75	1.76	1.48	1.11
Draw illustrations	0.86	1.10	0.68	1.00	1.32
Install wire/cables	0.76	0.78	1.18	1.13	0.93
Direct/lead teams	0.70	0.83	1.60	1.40	1.40
Provide programming/DP support	0.56	0.71	0.41	0.70	1.10
Engage in hand-to-hand combat	0.55	0.40	1.55	1.28	1.37
Handle demolitions/mines	0.48	0.33	1.15	0.95	1.10
Produce technical drawings	0.46	0.56	0.35	0.51	0.93
Determine fire data-indirect weap	0.36	0.48	0.60	0.51	0.71
Troubleshoot weapons	0.33	0.30	0.80	0.76	0.59
Inspect electrical systems	0.28	0.16	0.35	0.31	0.50
Analyze electronic signals	0.27	0.47	0.30	0.40	0.74
Translate foreign languages	0.26	0.38	0.21	0.31	0.83
Repair mechanical systems	0.25	0.21	0.56	0.53	0.61
Assemble steel structures	0.23	0.25	0.28	0.30	0.32
Prep equip/supplies for air drop	0.23	0.11	0.35	0.26	0.64
Inspect electronic systems	0.20	0.21	0.25	0.26	0.30
Troubleshoot mechanical systems	0.18	0.08	0.30	0.23	0.39
Receive clients/patients/guests	0.16	0.25	0.18	0.21	0.30
Construct wooden bldgs/struct	0.13	0.05	0.15	0.15	0.20
Repair weapons	0.10	0.11	0.23	0.20	0.25
Prepare parachutes	0.10	0.08	0.16	0.13	0.22
Operate radar	0.08	0.13	0.10	0.16	0.25
Provide medical/dental treatment	0.06	0.05	0.06	0.05	0.11
Control money	0.06	0.05	0.08	0.08	0.10
Construct masonry bldgs/struct	0.05	0.01	0.08	0.08	0.15
Estimate time/cost of maint ops	0.05	0.05	0.13	0.11	0.13
Repair electronic components	0.03	0.06	0.08	0.08	0.10
Operate lift/load/grade equip	0.03	0.00	0.06	0.05	0.10
Repair metal	0.03	0.01	0.03	0.03	0.01
Fire indirect fire weapons	0.01	0.00	0.03	0.03	0.03
Operate boats	0.01	0.00	0.01	0.01	0.01
Cook	0.01	0.03	0.03	0.05	0.06

(table continues)

Table B.11 (continued)

Task Categories	Rating FRE N=60	CTI N=60	GSI N=60	OJI N=60	DIF N=59
Install pipe assemblies	0.00	0.00	0.00	0.00	0.00
Load/unload artillery/tank guns	0.00	0.00	0.00	0.00	0.00
Prep heavy weap for tactical use	0.00	0.00	0.00	0.00	0.00
Fire heavy direct fire weapons	0.00	0.00	0.00	0.00	0.00
Control air traffic	0.00	0.00	0.00	0.00	0.00
Select/lay/clean med/dent equip	0.00	0.00	0.00	0.00	0.00
Repair electrical systems	0.00	0.00	0.00	0.00	0.00
Operate power excavating equip	0.00	0.00	0.00	0.00	0.00
Perform medical lab procedures	0.00	0.00	0.00	0.00	0.00
Repair plastic/fiberglass	0.00	0.00	0.00	0.00	0.00

Note. FRE = Frequency
CTI = Core Technical Importance
GSI = General Soldiering Importance
OJI = Overall Importance
DIF = Difficulty
N = the number of participants on which the task means for that rating were based

Appendix C

Correlations of Mean Frequency, Importance, and Difficulty Ratings Among Phase III MOS

	FR 12B	CT 12B	GS 12B	OJ 12B	DF 12B	FR 13B	CT 13B	GS 13B	OJ 13B	DF 13B	FR 27E	CT 27E	GS 27E	OJ 27E	DF 27E	FR 29E	CT 29E	GS 29E	OJ 29E	DF 29E
FR12B	1.00																			
CT12B	.99	1.00																		
GS12B	.97	.96	1.00																	
OJ12B	.99	.99	.99	1.00																
DF12B	.92	.95	.90	.94	1.00															
FR13B	.69	.65	.72	.68	.54	1.00														
CT13B	.69	.65	.73	.69	.55	.98	1.00													
GS13B	.83	.79	.89	.84	.70	.93	.95	1.00												
OJ13B	.75	.71	.80	.76	.62	.98	.99	.98	1.00											
DF13B	.70	.67	.76	.72	.62	.92	.96	.95	.97	1.00										
FR27E	.45	.42	.52	.46	.38	.48	.51	.58	.54	.59	1.00									
CT27E	.39	.36	.45	.40	.32	.43	.45	.51	.48	.54	.99	1.00								
GS27E	.80	.77	.87	.82	.70	.72	.73	.87	.79	.79	.81	.76	1.00							
OJ27E	.64	.61	.72	.66	.55	.61	.63	.75	.69	.72	.95	.92	.94	1.00						
DF27E	.55	.53	.63	.57	.51	.53	.56	.67	.61	.68	.95	.93	.88	.97	1.00					
FR29E	.41	.38	.46	.41	.31	.38	.37	.46	.41	.44	.88	.88	.71	.84	.84	1.00				
CT29E	.34	.31	.39	.34	.25	.32	.32	.39	.35	.39	.87	.88	.65	.80	.81	.99	1.00			
GS29E	.80	.77	.87	.81	.67	.67	.67	.83	.75	.72	.75	.70	.95	.89	.82	.77	.72	1.00		
OJ29E	.63	.60	.69	.64	.52	.54	.54	.67	.61	.61	.86	.84	.87	.92	.89	.94	.91	.94	1.00	
DF29E	.55	.52	.61	.56	.48	.45	.46	.58	.52	.56	.85	.83	.80	.89	.89	.94	.92	.87	.97	1.00
FR31C	.66	.62	.70	.66	.57	.55	.54	.65	.60	.60	.69	.68	.78	.77	.72	.76	.72	.83	.83	.78
CT31C	.62	.59	.67	.62	.55	.52	.52	.62	.57	.59	.71	.71	.77	.78	.75	.79	.76	.82	.84	.82
GS31C	.84	.81	.90	.85	.74	.70	.70	.85	.77	.76	.68	.63	.93	.84	.76	.66	.60	.95	.84	.78
OJ31C	.76	.73	.82	.77	.67	.63	.63	.77	.70	.70	.72	.69	.89	.84	.79	.75	.70	.92	.88	.83
DF31C	.68	.66	.75	.70	.64	.54	.56	.70	.62	.67	.73	.70	.83	.83	.82	.76	.72	.87	.86	.86
FR31D	.59	.56	.62	.58	.50	.52	.50	.58	.54	.53	.71	.72	.73	.74	.68	.78	.76	.76	.79	.74
CT31D	.57	.55	.61	.57	.49	.50	.48	.57	.52	.52	.72	.73	.73	.74	.70	.80	.78	.77	.81	.77
GS31D	.74	.71	.80	.75	.64	.63	.63	.77	.69	.69	.73	.69	.89	.84	.76	.73	.68	.91	.85	.79
OJ31D	.69	.66	.75	.70	.60	.60	.59	.71	.65	.64	.75	.73	.85	.82	.76	.78	.73	.88	.86	.80
DF31D	.60	.58	.67	.62	.56	.49	.49	.62	.55	.59	.75	.74	.79	.81	.78	.80	.77	.83	.86	.84
FR51B	.79	.78	.72	.76	.74	.49	.45	.56	.50	.44	.42	.38	.63	.53	.43	.38	.33	.63	.52	.43
CT51B	.71	.73	.63	.69	.71	.39	.36	.45	.39	.35	.38	.36	.53	.46	.38	.35	.32	.54	.46	.38
GS51B	.94	.92	.95	.94	.85	.68	.68	.83	.75	.70	.52	.45	.86	.71	.61	.46	.39	.86	.69	.60
OJ51B	.87	.87	.83	.86	.83	.55	.53	.67	.59	.54	.44	.39	.72	.59	.50	.39	.34	.73	.59	.50
DF51B	.81	.84	.77	.82	.84	.45	.44	.58	.50	.48	.39	.35	.63	.53	.47	.35	.31	.65	.53	.48
FR54B	.85	.82	.88	.85	.75	.70	.70	.82	.75	.73	.60	.56	.87	.76	.69	.55	.49	.86	.73	.66
CT54B	.84	.82	.87	.85	.76	.67	.68	.81	.73	.73	.60	.57	.85	.76	.69	.54	.50	.84	.72	.66
GS54B	.90	.88	.95	.91	.80	.73	.74	.89	.81	.79	.59	.53	.91	.78	.71	.52	.45	.89	.74	.66
OJ54B	.89	.86	.93	.90	.79	.71	.73	.87	.79	.78	.61	.56	.90	.78	.71	.54	.48	.89	.75	.68
DF54B	.82	.81	.86	.84	.81	.61	.64	.78	.70	.75	.57	.53	.82	.73	.72	.50	.45	.79	.69	.67
FR55B	.72	.67	.71	.70	.63	.57	.55	.65	.60	.57	.48	.44	.71	.60	.51	.44	.39	.70	.59	.52
CT55B	.73	.69	.74	.72	.65	.58	.56	.67	.62	.59	.47	.42	.72	.60	.53	.43	.38	.71	.60	.53
GS55B	.86	.82	.89	.86	.75	.69	.68	.82	.75	.71	.54	.47	.87	.72	.62	.47	.41	.86	.70	.61
OJ55B	.81	.77	.83	.80	.71	.64	.64	.77	.70	.67	.51	.45	.81	.68	.59	.46	.40	.81	.66	.59
DF55B	.78	.75	.81	.79	.74	.61	.61	.74	.67	.67	.50	.44	.79	.66	.61	.44	.38	.77	.64	.59
FR95B	.79	.75	.85	.80	.69	.63	.62	.78	.69	.67	.50	.43	.82	.67	.59	.48	.40	.83	.68	.60
CT95B	.80	.77	.87	.82	.72	.62	.62	.79	.70	.69	.48	.41	.82	.67	.60	.46	.38	.83	.67	.60
GS95B	.87	.84	.93	.89	.77	.68	.69	.86	.77	.75	.51	.44	.88	.72	.63	.47	.39	.88	.70	.63
OJ95B	.83	.80	.90	.85	.74	.65	.65	.82	.73	.72	.50	.43	.85	.70	.62	.47	.39	.85	.69	.62
DF95B	.75	.73	.81	.77	.73	.54	.55	.72	.63	.66	.44	.38	.76	.63	.59	.41	.34	.76	.61	.59
FR96B	.54	.50	.58	.53	.48	.39	.37	.49	.43	.43	.39	.37	.60	.50	.46	.43	.38	.61	.52	.48
CT96B	.44	.42	.48	.45	.42	.29	.28	.39	.33	.36	.33	.31	.50	.41	.39	.36	.33	.51	.43	.42
GS96B	.81	.78	.88	.83	.73	.63	.63	.79	.71	.69	.52	.47	.85	.71	.63	.52	.45	.87	.72	.65
OJ96B	.69	.66	.75	.70	.63	.52	.51	.66	.58	.58	.46	.42	.74	.62	.56	.47	.42	.76	.63	.58
DF96B	.60	.57	.66	.62	.59	.41	.40	.55	.47	.50	.38	.35	.64	.53	.50	.40	.36	.66	.55	.53

(table continues)

	FR 31C	CT 31C	GS 31C	OJ 31C	DF 31C	FR 31D	CT 31D	GS 31D	OJ 31D	DF 31D	FR 51B	CT 51B	GS 51B	OJ 51B	DF 51B	FR 54B	CT 54B	GS 54B	OJ 54B	DF 54B
FR31C	1.00																			
CT31C	.99	1.00																		
GS31C	.89	.88	1.00																	
OJ31C	.96	.96	.97	1.00																
DF31C	.92	.94	.92	.97	1.00															
FR31D	.90	.90	.79	.86	.80	1.00														
CT31D	.90	.91	.79	.86	.83	.99	1.00													
GS31D	.87	.86	.93	.92	.87	.89	.90	1.00												
OJ31D	.91	.91	.90	.93	.87	.95	.96	.98	1.00											
DF31D	.87	.89	.85	.90	.91	.90	.92	.93	.95	1.00										
FR51B	.54	.49	.63	.58	.48	.53	.50	.61	.58	.48	1.00									
CT51B	.48	.44	.54	.50	.41	.50	.48	.53	.52	.44	.97	1.00								
GS51B	.65	.61	.86	.77	.68	.59	.58	.80	.73	.64	.85	.78	1.00							
OJ51B	.57	.53	.73	.65	.56	.54	.52	.68	.63	.55	.97	.93	.94	1.00						
DF51B	.52	.49	.65	.60	.54	.49	.48	.61	.57	.52	.93	.93	.88	.97	1.00					
FR54B	.80	.78	.91	.87	.80	.70	.69	.82	.79	.71	.66	.58	.84	.73	.66	1.00				
CT54B	.79	.79	.90	.86	.81	.70	.70	.81	.79	.72	.62	.56	.82	.71	.65	.99	1.00			
GS54B	.76	.74	.94	.87	.81	.66	.65	.84	.79	.72	.64	.54	.90	.76	.68	.96	.95	1.00		
OJ54B	.79	.78	.93	.89	.83	.69	.68	.84	.80	.73	.64	.56	.88	.75	.68	.98	.98	.99	1.00	
DF54B	.75	.75	.87	.84	.84	.63	.62	.76	.72	.71	.53	.48	.78	.65	.63	.92	.94	.93	.95	1.00
FR55B	.58	.53	.68	.63	.54	.52	.50	.63	.59	.50	.64	.57	.73	.65	.58	.73	.70	.71	.72	.66
CT55B	.57	.53	.70	.64	.55	.51	.49	.64	.59	.49	.62	.55	.74	.66	.59	.76	.73	.74	.75	.69
GS55B	.65	.61	.86	.77	.68	.57	.55	.78	.70	.61	.68	.58	.89	.77	.68	.86	.83	.89	.88	.80
OJ55B	.62	.58	.79	.72	.63	.53	.52	.71	.65	.56	.65	.56	.83	.72	.64	.82	.79	.83	.83	.76
DF55B	.62	.59	.78	.72	.66	.52	.50	.68	.63	.56	.60	.51	.79	.68	.62	.81	.79	.82	.83	.80
FR95B	.72	.68	.86	.80	.72	.62	.61	.77	.74	.66	.55	.44	.80	.64	.55	.82	.79	.87	.85	.78
CT95B	.71	.67	.86	.80	.73	.60	.58	.77	.73	.66	.52	.42	.80	.63	.55	.81	.80	.88	.86	.80
GS95B	.73	.70	.92	.84	.78	.62	.61	.81	.76	.69	.59	.47	.88	.71	.63	.86	.85	.94	.91	.84
OJ95B	.72	.68	.89	.82	.75	.61	.60	.79	.74	.68	.55	.44	.83	.67	.59	.84	.82	.91	.89	.83
DF95B	.68	.65	.82	.77	.75	.54	.53	.71	.66	.64	.44	.34	.72	.56	.51	.78	.77	.84	.83	.84
FR96B	.68	.66	.67	.67	.62	.57	.57	.61	.61	.56	.35	.28	.49	.37	.31	.69	.68	.65	.67	.66
CT96B	.58	.57	.57	.58	.55	.49	.50	.51	.52	.50	.22	.18	.38	.26	.22	.58	.60	.56	.58	.60
GS96B	.78	.74	.91	.86	.79	.66	.65	.82	.78	.71	.55	.45	.80	.65	.56	.87	.86	.91	.90	.85
OJ96B	.73	.71	.81	.78	.72	.61	.60	.73	.70	.65	.44	.36	.66	.52	.45	.80	.79	.80	.81	.79
DF96B	.66	.65	.72	.71	.69	.55	.54	.64	.61	.60	.34	.27	.55	.42	.37	.72	.73	.72	.74	.77

(table continues)

	FR 55B	CT 55B	GS 55B	OJ 55B	DF 55B	FR 95B	CT 95B	GS 95B	OJ 95B	DF 95B	FR 96B	CT 96B	GS 96B	OJ 96B	DF 96B
FR55B	1.00														
CT55B	.99	1.00													
GS55B	.92	.93	1.00												
OJ55B	.96	.98	.99	1.00											
DF55B	.93	.96	.95	.97	1.00										
FR95B	.67	.68	.82	.77	.75	1.00									
CT95B	.64	.66	.82	.76	.75	.99	1.00								
GS95B	.67	.70	.87	.80	.79	.96	.97	1.00							
OJ95B	.66	.68	.84	.78	.77	.99	1.00	.99	1.00						
DF95B	.60	.62	.76	.71	.74	.93	.95	.93	.95	1.00					
FR96B	.51	.50	.56	.54	.56	.73	.70	.66	.70	.71	1.00				
CT96B	.38	.38	.45	.42	.45	.66	.64	.59	.62	.67	.97	1.00			
GS96B	.67	.68	.83	.77	.76	.90	.90	.92	.91	.87	.86	.79	1.00		
OJ96B	.59	.59	.72	.67	.67	.84	.83	.82	.84	.83	.95	.91	.97	1.00	
DF96B	.51	.52	.62	.58	.61	.77	.78	.75	.77	.83	.93	.91	.91	.97	1.00

Appendix D

Means and Standard Deviations for 18 MOS on 26 Attribute Measures and 2 Criterion Measures: Project A Concurrent Validation Samples

Key to Attribute Abbreviations of Column Headings

Verb = Verbal Ability

Reas = Reasoning

Numb = Number Ability

Spat = Spatial Ability

InPr = Mental Information Processing

PS&A = Perceptual Speed & Accuracy

Mem = Memory

Mech = Mechanical Comprehension

E-LC = Eye-Limb Coordination

Prec = Precision

MJud = Movement Judgment

Dext = Hand & Finger Dexterity

Athl = Involvement in Athletics

WkOr = Work Orientation

Coop = Cooperation/Stability

Ener = Energy

Cons = Conscientiousness

Dom = Dominance/Confidence

Tool = Interest in Using Tools

Rugd = Interest in Rugged Activities

Prot = Interest in Protective Services

Tech = Interest in Technical Activities

Sci = Interest in Science

Lead = Interest in Leadership

Art = Interest in Artistic Activities

Org = Interest in Efficiency & Organization

MOS		Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr
		Attribute													
11B	Mean	104.80	103.74	102.16	103.51	98.75	102.14	50.82	137.42	2.03	4.71	8.26	17.76	14.52	146.73
N=491	S.D.	13.35	16.96	17.23	17.58	28.84	16.54	13.74	15.48	13.82	17.20	7.93	7.34	2.96	26.81
12B	Mean	100.23	102.02	98.19	100.97	100.54	99.67	49.69	135.45	0.49	1.88	6.42	17.03	14.46	148.69
N=544	S.D.	14.82	16.10	17.44	16.81	20.79	17.96	13.93	16.92	13.05	17.45	8.74	7.11	2.90	26.03
13B	Mean	97.50	98.41	96.45	96.07	96.15	96.68	48.89	127.40	-0.88	-1.64	6.63	18.07	14.04	149.74
N=464	S.D.	14.73	16.89	17.38	17.59	25.76	18.43	15.63	18.66	13.16	18.78	8.61	7.09	2.87	25.28
16S	Mean	101.45	100.80	96.56	99.93	100.12	101.79	48.93	134.30	1.47	3.32	7.72	17.64	14.00	148.55
N=338	S.D.	13.36	16.42	19.32	17.41	28.00	16.01	15.80	17.25	12.82	17.73	8.14	8.08	2.79	26.99
19K	Mean	104.00	103.92	100.55	102.33	100.42	102.52	50.28	138.36	3.21	3.79	7.95	16.99	13.87	149.36
N=394	S.D.	14.46	15.83	18.90	16.88	24.50	17.49	14.64	16.29	12.27	17.20	8.08	7.30	3.04	28.21
27E	Mean	106.44	108.08	104.39	104.02	100.55	102.45	49.18	138.89	3.21	4.16	8.13	16.93	13.74	146.97
N=123	S.D.	11.49	14.37	13.77	16.19	24.91	17.23	12.97	14.66	12.73	18.88	7.30	7.26	3.06	25.33
31C	Mean	103.89	104.52	105.45	101.71	99.80	104.61	52.05	133.11	2.26	0.25	7.65	19.31	14.11	150.29
N=289	S.D.	12.29	14.50	16.75	16.92	21.31	15.26	13.51	17.29	13.53	18.58	8.57	6.92	3.04	23.44
51B	Mean	100.49	101.22	95.13	99.00	98.88	96.27	45.47	135.78	-1.42	-1.10	6.91	14.52	13.51	145.38
N=69	S.D.	12.23	16.50	16.70	18.22	19.75	18.85	13.40	15.25	14.23	18.42	7.74	7.14	2.90	26.22
54B	Mean	106.97	104.51	102.24	101.25	98.11	99.97	49.95	135.21	1.19	0.71	6.85	16.47	14.03	153.54
N=340	S.D.	11.57	15.58	18.06	17.69	23.42	18.25	13.14	16.00	13.22	18.41	9.06	8.28	2.91	27.19
55B	Mean	97.13	95.72	91.09	92.46	93.38	92.62	46.98	127.83	-3.94	-4.64	4.41	14.93	13.74	145.90
N=203	S.D.	11.35	17.03	17.57	16.60	26.86	19.44	14.67	13.92	15.30	19.04	9.93	8.83	3.06	23.57
63B	Mean	100.22	103.78	98.24	101.63	100.54	99.50	49.93	138.99	0.24	0.25	6.96	15.72	13.64	145.75
N=478	S.D.	12.85	16.10	15.76	17.42	22.27	17.04	13.49	16.17	13.35	18.56	8.42	7.94	3.10	27.25
67N	Mean	111.24	111.08	109.17	111.73	104.40	108.69	53.95	150.58	6.23	12.70	10.01	17.53	14.50	159.67
N=238	S.D.	9.78	11.13	14.52	14.81	13.57	13.16	11.22	10.46	11.47	16.13	7.69	6.73	2.58	26.73
71L	Mean	100.77	100.94	102.5[illegible]	94.20	102.36	99.53	51.66	120.05	-6.10	-11.27	2.23	15.06	13.01	156.85
N=427	S.D.	13.07	16.78	16.08	16.30	24.67	17.53	12.20	16.34	15.45	19.05	10.82	7.93	3.46	24.80
76Y	Mean	98.84	100.74	99.25	95.72	99.15	97.71	50.02	124.00	-1.84	-4.45	4.55	16.37	13.85	150.81
N=444	S.D.	14.15	17.76	17.63	17.16	30.13	17.97	15.02	18.18	13.91	19.70	11.73	7.38	3.23	24.36
88M	Mean	96.67	98.90	92.88	97.04	99.34	95.76	47.57	132.42	0.15	-1.06	6.26	16.64	13.69	145.44
N=507	S.D.	12.58	16.84	17.21	16.13	21.82	18.15	15.19	15.58	13.32	18.33	8.27	8.14	2.94	24.67
91A	Mean	108.73	106.82	103.29	101.42	103.01	102.98	52.47	133.28	-0.91	-1.21	6.12	15.81	13.69	151.67
N=392	S.D.	9.64	13.88	15.36	16.50	15.50	15.93	12.63	15.92	13.65	17.96	7.88	7.55	3.30	26.67
94B	Mean	99.93	98.86	97.40	94.81	98.53	94.93	47.02	127.72	-4.41	-6.37	4.88	14.85	13.40	153.69
N=368	S.D.	13.00	18.71	16.99	17.71	23.28	18.33	16.57	16.58	15.10	19.03	10.07	8.89	3.06	24.58
95B	Mean	110.39	107.34	107.14	107.72	104.57	105.13	51.40	141.88	3.10	5.95	8.93	17.99	14.03	150.08
N=597	S.D.	8.09	12.97	14.02	14.96	15.46	15.49	13.03	12.78	14.11	16.57	7.45	7.44	3.17	26.43

(table continues)

MOS		Attribute												Criterion	
		Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org	Core	Overall
11B	Mean	148.95	47.73	98.18	101.85	202.32	157.73	103.38	149.45	198.82	40.38	14.22	193.94	102.90	49.95
N=491	S.D.	26.82	6.10	17.50	17.84	31.21	24.99	17.05	23.58	30.45	8.90	4.26	30.43	16.08	7.35
12B	Mean	149.43	48.48	99.95	99.71	212.33	156.80	101.84	153.02	198.61	39.64	13.44	198.41	50.85	50.00
N=544	S.D.	26.51	6.10	16.77	17.67	27.08	23.16	15.17	21.57	27.41	7.99	4.02	28.72	9.60	7.04
13B	Mean	150.40	48.44	102.32	100.49	207.05	151.37	103.11	155.06	206.46	40.77	14.21	208.40	102.03	50.05
N=464	S.D.	25.50	6.05	17.11	17.08	30.69	25.94	16.60	23.71	28.40	8.31	4.02	30.12	16.92	6.84
16S	Mean	149.82	47.95	100.10	101.41	204.51	154.81	100.53	154.06	202.54	40.30	13.86	198.25	51.59	49.95
N=338	S.D.	26.67	6.14	16.78	18.42	29.84	23.85	16.76	21.64	27.94	7.60	3.93	27.44	9.42	7.10
19K	Mean	149.42	48.24	100.72	101.01	208.09	160.80	101.08	151.70	198.09	39.31	13.68	198.59	102.72	49.95
N=394	S.D.	26.56	6.38	17.46	19.24	26.21	22.71	15.40	23.55	28.87	8.50	4.03	28.43	15.03	6.89
27E	Mean	153.58	47.82	101.50	99.26	205.67	145.64	93.47	153.00	204.52	39.15	13.85	193.60	50.55	50.00
N=123	S.D.	24.20	5.54	16.98	18.77	25.10	25.16	14.80	21.41	25.18	8.10	3.68	29.10	10.13	6.46
31C	Mean	151.63	48.95	103.52	101.70	196.02	146.00	95.79	158.94	206.30	41.82	14.67	201.25	101.53	50.00
N=289	S.D.	25.11	5.28	16.38	17.26	32.91	25.96	17.26	21.88	26.73	8.08	3.98	28.47	17.00	6.59
51B	Mean	146.38	47.82	99.83	93.34	214.03	153.25	98.63	148.75	187.09	36.64	12.72	192.95	51.26	49.95
N=69	S.D.	25.45	5.79	17.25	18.55	32.30	27.58	15.25	24.04	30.83	9.99	4.08	30.93	10.13	7.01
54B	Mean	155.41	49.37	103.49	104.48	197.01	151.99	100.35	154.30	216.27	41.89	14.99	199.70	50.72	50.00
N=340	S.D.	24.27	5.90	16.89	17.06	32.05	26.68	16.62	21.46	28.25	8.84	4.02	30.50	9.91	6.95
55B	Mean	148.84	48.43	99.73	95.69	203.63	150.19	99.52	151.17	196.73	39.45	14.11	205.80	50.70	50.05
N=203	S.D.	24.00	4.93	15.66	15.49	31.69	25.79	16.77	25.54	30.10	8.26	3.98	29.18	9.68	6.43
63B	Mean	143.71	47.63	99.76	94.42	220.40	156.87	98.25	144.77	190.65	37.54	12.56	195.18	102.63	50.00
N=478	S.D.	27.45	6.26	17.31	17.97	28.57	24.74	16.01	24.24	30.65	8.29	3.97	29.57	15.24	6.37
67N	Mean	159.87	50.13	105.79	105.09	205.29	155.96	97.55	148.71	196.32	39.08	13.44	184.53	51.01	50.05
N=238	S.D.	25.60	6.13	15.98	18.25	26.99	21.40	16.12	23.07	27.95	8.16	4.09	25.81	9.28	6.70
71L	Mean	149.90	49.30	108.81	99.12	171.84	130.82	92.39	147.28	202.28	41.95	15.85	205.57	101.17	50.05
N=427	S.D.	27.33	6.12	14.21	19.63	34.19	25.78	16.51	22.50	26.98	8.26	4.02	27.65	17.36	6.48
76Y	Mean	150.28	48.51	104.78	99.10	190.07	140.65	95.22	152.39	205.65	40.85	14.82	211.41	51.63	49.95
N=444	S.D.	24.95	5.43	15.62	18.10	32.63	26.08	17.67	23.26	27.50	8.10	3.86	29.39	9.34	6.65
88M	Mean	145.10	47.54	100.70	95.85	211.61	149.68	100.18	145.70	191.01	37.45	13.24	197.61	101.98	50.00
N=507	S.D.	26.11	5.74	15.77	16.81	29.89	23.73	17.29	24.85	29.35	8.43	3.97	29.71	14.48	6.81
91A	Mean	150.44	48.38	104.87	101.21	183.60	141.51	97.66	149.11	212.19	42.28	15.83	196.37	102.89	50.00
N=392	S.D.	28.43	6.61	16.28	18.21	33.99	27.61	17.11	23.69	25.37	8.23	4.17	28.49	15.90	6.89
94B	Mean	148.21	48.68	103.16	99.82	192.57	142.43	94.13	149.03	196.14	40.11	14.82	219.93	52.62	50.00
N=368	S.D.	26.94	5.89	16.08	18.50	33.57	26.93	17.19	24.78	28.83	8.55	3.89	30.64	9.01	6.45
95B	Mean	153.37	48.72	105.16	102.02	188.53	153.68	112.73	140.44	188.13	39.50	13.57	187.36	100.86	50.00
N=597	S.D.	25.33	5.94	15.31	17.85	29.92	22.48	13.19	22.03	27.73	8.40	4.13	26.86	14.73	6.72

Appendix E

Normalized Attribute Weights for 18 MOS by Different Criterion Measures and by Different Weighting Methods

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Key to Attribute Abbreviations of Column Headings

Verb	=	Verbal Ability
Reas	=	Reasoning
Numb	=	Number Ability
Spat	=	Spatial Ability
InPr	=	Mental Information Processing
PS&A	=	Perceptual Speed & Accuracy
Mem	=	Memory
Mech	=	Mechanical Comprehension
E-LC	=	Eye-Limb Coordination
Prec	=	Precision
MJud	=	Movement Judgment
Dext	=	Hand & Finger Dexterity
Athl	=	Involvement in Athletics
WkOr	=	Work Orientation
Coop	=	Cooperation/Stability
Ener	=	Energy
Cons	=	Conscientiousness
Dom	=	Dominance/Confidence
Tool	=	Interest in Using Tools
Rugd	=	Interest in Rugged Activities
Prot	=	Interest in Protective Services
Tech	=	Interest in Technical Activities
Sci	=	Interest in Science
Lead	=	Interest in Leadership
Art	=	Interest in Artistic Activities
Org	=	Interest in Efficiency & Organization

Table E.1

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Mean Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.13	.13	.09	.11	.10	.10	.11	.08	.08	.07	.07	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
12B	.13	.13	.09	.11	.10	.09	.10	.09	.08	.07	.07	.07	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
13B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.08	.07	.06	.06	.04	.06	.02	.07
16S	.13	.13	.09	.11	.10	.10	.11	.08	.07	.07	.06	.07	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.04	.06	.02	.07
19K	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.07	.08	.05	.10	.07	.08	.09	.07	.08	.07	.06	.07	.04	.05	.02	.07
27E	.14	.13	.10	.10	.10	.09	.11	.10	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.08	.05	.05	.08	.05	.06	.02	.07
31C	.14	.13	.10	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.05	.05	.07	.05	.06	.02	.07
51B	.13	.12	.09	.11	.09	.09	.10	.09	.08	.08	.06	.08	.06	.11	.07	.08	.09	.07	.08	.07	.05	.07	.04	.06	.02	.07
54B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
55B	.14	.13	.09	.10	.10	.10	.11	.08	.08	.07	.06	.07	.06	.11	.08	.09	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
63B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.06	.08	.05	.10	.07	.08	.09	.07	.08	.06	.06	.07	.04	.06	.02	.07
67N	.14	.13	.10	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.11	.07	.08	.09	.07	.07	.05	.05	.07	.05	.06	.02	.08
71L	.15	.13	.10	.09	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.09	.08	.06	.05	.06	.06	.04	.06	.03	.08
76Y	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.08	.05	.11	.07	.08	.10	.07	.07	.05	.05	.06	.04	.06	.02	.08
88M	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.05	.11	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
91A	.15	.13	.10	.10	.10	.09	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.08	.06	.05	.06	.06	.05	.06	.03	.08
94B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.10	.07	.06	.05	.05	.06	.04	.06	.03	.08
95B	.14	.13	.09	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.09	.08	.06	.06	.06	.06	.04	.07	.02	.07

Table E.2

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights and MOS Mean Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.25	.25	.05	.14	.06	.07	.16	.08	.09	.03	.05	.08	.03	.04	.05	.03	.02	.04	.06	.07	.01	.02	.00	.03	.00	.02
12B	.24	.24	.05	.15	.05	.06	.14	.11	.11	.03	.06	.07	.03	.04	.04	.03	.02	.04	.09	.06	.01	.01	.00	.03	.00	.02
13B	.24	.24	.05	.15	.05	.06	.13	.13	.10	.03	.06	.08	.02	.03	.04	.02	.02	.03	.07	.08	.01	.02	.00	.03	.00	.03
16S	.26	.26	.05	.14	.06	.07	.16	.08	.07	.02	.05	.07	.02	.04	.04	.03	.02	.04	.06	.05	.01	.02	.00	.03	.00	.02
19K	.24	.24	.05	.15	.05	.08	.15	.12	.09	.03	.05	.08	.02	.03	.03	.02	.01	.03	.08	.06	.01	.03	.00	.02	.00	.02
27E	.30	.30	.05	.13	.03	.06	.13	.12	.04	.03	.03	.07	.01	.04	.04	.03	.02	.03	.09	.02	.00	.06	.00	.03	.00	.04
31C	.30	.28	.06	.12	.04	.07	.15	.11	.06	.02	.03	.07	.01	.04	.04	.03	.02	.03	.07	.02	.00	.05	.01	.03	.00	.03
51B	.24	.23	.04	.17	.03	.04	.11	.17	.12	.03	.04	.08	.01	.04	.04	.03	.02	.04	.13	.04	.01	.01	.00	.03	.01	.03
54B	.29	.28	.06	.12	.05	.06	.15	.09	.07	.02	.04	.06	.02	.04	.04	.03	.02	.03	.06	.04	.01	.02	.01	.03	.00	.04
55B	.30	.26	.04	.12	.04	.06	.14	.09	.10	.03	.06	.07	.02	.04	.05	.03	.02	.04	.06	.05	.01	.01	.00	.03	.00	.07
63B	.26	.26	.05	.14	.04	.07	.15	.12	.08	.03	.05	.08	.02	.03	.04	.02	.01	.03	.09	.05	.01	.03	.00	.02	.00	.04
67N	.31	.29	.05	.13	.03	.07	.14	.11	.05	.02	.03	.07	.01	.04	.04	.03	.02	.04	.08	.02	.00	.03	.00	.03	.00	.06
71L	.33	.30	.03	.09	.05	.08	.16	.05	.07	.02	.04	.07	.03	.05	.06	.03	.02	.04	.04	.05	.01	.03	.00	.03	.00	.07
76Y	.34	.30	.05	.11	.03	.07	.13	.08	.07	.02	.04	.07	.01	.04	.04	.02	.02	.03	.06	.03	.00	.03	.00	.03	.00	.10
88M	.29	.27	.04	.13	.04	.07	.16	.08	.09	.02	.06	.06	.02	.03	.04	.03	.02	.04	.06	.04	.01	.01	.00	.03	.00	.04
91A	.32	.30	.06	.09	.04	.06	.17	.06	.05	.01	.04	.09	.02	.04	.07	.02	.02	.04	.05	.03	.01	.02	.00	.04	.00	.05
94B	.32	.29	.10	.10	.03	.06	.13	.08	.06	.01	.03	.06	.02	.05	.05	.03	.02	.04	.05	.03	.00	.01	.00	.04	.00	.13
95B	.29	.28	.04	.11	.06	.07	.17	.05	.08	.02	.04	.06	.03	.05	.07	.03	.02	.05	.04	.05	.02	.02	.00	.04	.00	.03

Table E.3

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights and MOS Mean Component Weights

MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.27	.24	.04	.14	.06	.06	.14	.10	.09	.03	.05	.08	.03	.03	.04	.02	.01	.04	.06	.07	.01	.02	.00	.03	.00	.02
12B	.26	.23	.05	.16	.05	.05	.12	.12	.11	.03	.06	.07	.03	.03	.04	.02	.01	.04	.08	.06	.01	.02	.00	.03	.00	.02
13B	.25	.23	.05	.15	.05	.06	.12	.14	.10	.03	.06	.07	.02	.03	.04	.02	.01	.03	.07	.08	.01	.02	.00	.03	.00	.02
16S	.28	.26	.04	.15	.06	.07	.14	.10	.07	.03	.05	.07	.02	.03	.04	.03	.01	.04	.06	.05	.01	.02	.00	.03	.00	.02
19K	.25	.23	.05	.16	.05	.07	.13	.14	.09	.04	.05	.07	.02	.02	.03	.02	.01	.03	.08	.06	.01	.03	.00	.02	.00	.02
27E	.31	.28	.05	.13	.03	.06	.11	.14	.04	.03	.03	.07	.01	.03	.04	.02	.01	.03	.09	.02	.00	.06	.00	.03	.00	.04
31C	.31	.27	.06	.12	.04	.07	.13	.12	.06	.02	.03	.07	.01	.03	.04	.02	.01	.03	.07	.02	.00	.05	.00	.03	.00	.03
51B	.25	.22	.04	.17	.03	.04	.10	.18	.11	.03	.04	.08	.01	.03	.04	.02	.01	.04	.13	.03	.01	.01	.00	.03	.00	.03
54B	.31	.27	.06	.13	.04	.06	.13	.10	.07	.02	.04	.06	.02	.03	.04	.02	.01	.03	.05	.04	.01	.02	.01	.03	.00	.04
55B	.32	.25	.04	.12	.04	.05	.12	.10	.10	.03	.06	.06	.02	.04	.05	.03	.02	.04	.06	.05	.01	.01	.00	.03	.00	.07
63B	.27	.24	.05	.14	.04	.06	.13	.13	.09	.03	.05	.08	.02	.03	.03	.02	.01	.03	.08	.05	.01	.03	.00	.02	.00	.04
67N	.33	.27	.05	.13	.03	.06	.12	.13	.05	.02	.03	.07	.01	.03	.04	.02	.01	.04	.08	.02	.01	.03	.00	.03	.00	.06
71L	.36	.28	.04	.09	.05	.08	.14	.06	.07	.02	.04	.07	.03	.04	.06	.02	.01	.04	.03	.05	.01	.04	.00	.03	.00	.07
76Y	.37	.28	.06	.11	.03	.07	.11	.09	.07	.02	.04	.07	.01	.03	.04	.02	.01	.03	.06	.03	.00	.03	.00	.03	.00	.09
11B	.27	.24	.04	.14	.06	.06	.14	.10	.09	.03	.05	.08	.03	.03	.04	.02	.01	.04	.06	.07	.01	.02	.00	.03	.00	.02
12B	.26	.23	.05	.16	.05	.05	.12	.12	.11	.03	.06	.07	.03	.03	.04	.02	.01	.04	.08	.06	.01	.02	.00	.03	.00	.02
88M	.31	.26	.04	.14	.04	.06	.14	.10	.09	.02	.06	.06	.02	.03	.04	.02	.01	.04	.06	.04	.01	.01	.00	.03	.00	.04
91A	.35	.29	.06	.09	.04	.05	.15	.07	.06	.01	.03	.09	.02	.03	.07	.02	.01	.04	.05	.03	.01	.02	.00	.03	.00	.05
94B	.35	.28	.10	.10	.03	.06	.11	.09	.06	.01	.04	.05	.02	.04	.05	.03	.02	.04	.04	.03	.00	.01	.00	.04	.00	.13
95B	.32	.27	.04	.12	.06	.06	.15	.06	.08	.02	.04	.06	.03	.04	.07	.02	.01	.05	.04	.05	.02	.02	.00	.04	.00	.03

Table E.4

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Mean Component Weights, .95 Stepwise Reduction

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.26	.00	.00	.31	.00	.00	.19	.00	.18	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.14	.00	.19	.00	.00	.00	.00
12B	.26	.00	.00	.31	.00	.00	.19	.00	.18	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.14	.00	.19	.00	.00	.00	.00
13B	.30	.00	.00	.31	.00	.00	.19	.00	.19	.00	.00	.00	.00	.39	.00	.00	.00	.00	.14	.00	.00	.18	.00	.00	.00	.00
16S	.28	.00	.00	.33	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
19K	.27	.00	.00	.33	.00	.00	.19	.00	.19	.00	.00	.00	.00	.34	.00	.00	.00	.00	.19	.00	.00	.00	.00	.19	.00	.00
27E	.29	.00	.00	.33	.00	.00	.19	.00	.18	.00	.00	.00	.00	.34	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
31C	.29	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
51B	.27	.00	.00	.33	.00	.00	.18	.00	.20	.00	.00	.00	.00	.36	.00	.00	.00	.00	.19	.00	.00	.00	.00	.20	.00	.00
54B	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
55B	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.36	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
63B	.28	.00	.00	.33	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
67N	.29	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
71L	.31	.29	.00	.00	.00	.00	.19	.00	.20	.00	.00	.00	.00	.36	.00	.00	.00	.00	.17	.00	.00	.00	.00	.19	.00	.00
76Y	.31	.29	.00	.00	.00	.00	.19	.00	.20	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.19	.00	.00
88M	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
91A	.29	.26	.00	.00	.00	.00	.19	.00	.00	.23	.00	.00	.00	.35	.00	.00	.00	.00	.16	.00	.00	.00	.00	.20	.00	.00
94B	.31	.29	.00	.00	.00	.00	.19	.00	.20	.00	.00	.00	.00	.36	.00	.00	.00	.00	.18	.00	.00	.00	.00	.19	.00	.00
95B	.28	.00	.00	.31	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00

Table E.5

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Mean Component Weights, Top 5 Stepwise Reduction

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.27	.00	.00	.38	.00	.00	.00	.00	.22	.00	.00	.00	.00	.41	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
12B	.27	.00	.00	.38	.00	.00	.00	.00	.22	.00	.00	.00	.00	.41	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
13B	.27	.00	.00	.38	.00	.00	.00	.00	.22	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
16S	.33	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
19K	.33	.00	.00	.38	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.23	.00	.00	.00	.00	.00	.00	.00
27E	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
31C	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
51B	.21	.00	.00	.40	.00	.00	.00	.00	.23	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00
54B	.23	.00	.00	.44	.00	.00	.19	.00	.00	.00	.00	.00	.00	.35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
55B	.00	.00	.00	.47	.00	.00	.19	.00	.22	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.24	.00	.00
63B	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
67N	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
71L	.27	.34	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
76Y	.38	.33	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.23	.00	.00	.00	.00	.00	.00	.00
88M	.33	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
91A	.26	.31	.00	.00	.00	.00	.00	.00	.00	.28	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
94B	.27	.34	.00	.00	.00	.00	.00	.00	.24	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
95B	.00	.00	.00	.47	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00

Table E.6

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Mean Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.47	.33	.31
12B	.46	.33	.32
13B	.45	.33	.33
16S	.47	.33	.31
19K	.44	.33	.34
27E	.45	.32	.34
31C	.47	.33	.31
51B	.44	.33	.34
54B	.47	.34	.30
55B	.47	.33	.30
63B	.45	.33	.33
67N	.46	.32	.32
71L	.50	.33	.27
76Y	.48	.33	.29
88M	.47	.33	.31
91A	.50	.33	.27
94B	.48	.34	.28
95B	.50	.33	.28

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.7

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Threshold Component Weights

MOS	Attribute																									
	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.12	.12	.09	.11	.11	.11	.11	.08	.09	.08	.08	.08	.06	.10	.06	.08	.09	.06	.07	.08	.07	.06	.04	.05	.02	.06
12B	.11	.12	.08	.12	.11	.11	.11	.09	.09	.08	.08	.08	.06	.10	.06	.08	.09	.06	.08	.09	.06	.07	.04	.04	.01	.06
13B	.11	.11	.09	.12	.10	.10	.10	.11	.10	.09	.08	.09	.06	.10	.06	.08	.09	.06	.09	.09	.06	.07	.04	.04	.00	.06
16S	.12	.12	.09	.12	.11	.11	.11	.09	.08	.08	.08	.07	.06	.10	.06	.08	.09	.06	.07	.08	.06	.07	.04	.05	.02	.06
19K	.12	.12	.09	.11	.11	.10	.11	.09	.09	.08	.07	.08	.06	.10	.06	.08	.09	.06	.08	.08	.06	.07	.04	.05	.01	.06
27E	.12	.13	.09	.11	.09	.10	.10	.14	.07	.08	.06	.10	.04	.10	.05	.07	.08	.05	.11	.05	.04	.11	.05	.04	.01	.07
31C	.14	.13	.10	.10	.11	.11	.11	.10	.08	.08	.06	.09	.04	.10	.05	.07	.09	.05	.08	.04	.04	.09	.05	.04	.02	.07
51B	.13	.12	.11	.13	.08	.08	.09	.12	.10	.08	.05	.08	.07	.11	.05	.08	.08	.05	.11	.07	.04	.08	.04	.04	.02	.07
54B	.13	.13	.09	.11	.11	.10	.11	.09	.08	.07	.07	.07	.05	.10	.06	.07	.09	.06	.08	.07	.06	.08	.05	.05	.02	.06
55B	.14	.11	.10	.11	.10	.10	.10	.10	.10	.07	.07	.07	.07	.11	.06	.09	.10	.05	.10	.06	.04	.07	.03	.04	.01	.10
63B	.12	.12	.08	.11	.10	.10	.11	.12	.09	.09	.07	.09	.05	.10	.06	.07	.09	.05	.09	.07	.06	.08	.05	.04	.01	.07
67N	.16	.14	.10	.10	.09	.09	.11	.13	.06	.06	.05	.07	.05	.11	.06	.07	.09	.06	.08	.03	.04	.09	.06	.05	.01	.09
71L	.16	.13	.10	.08	.10	.13	.11	.07	.09	.09	.06	.10	.04	.11	.06	.08	.10	.05	.05	.03	.05	.06	.05	.04	.03	.10
76Y	.18	.14	.13	.08	.10	.13	.12	.06	.07	.06	.05	.08	.04	.11	.06	.08	.11	.05	.05	.01	.04	.06	.04	.04	.03	.14
88M	.13	.12	.09	.12	.09	.10	.10	.10	.09	.07	.07	.07	.06	.10	.06	.08	.10	.05	.09	.07	.06	.08	.04	.04	.01	.08
91A	.15	.14	.09	.08	.11	.08	.13	.06	.07	.08	.04	.09	.04	.11	.10	.08	.09	.08	.04	.04	.07	.05	.07	.07	.04	.05
94B	.18	.13	.13	.08	.11	.10	.11	.08	.07	.06	.05	.08	.04	.11	.06	.08	.09	.05	.05	.02	.04	.07	.05	.04	.06	.12
95B	.13	.13	.08	.10	.11	.09	.11	.07	.08	.07	.07	.07	.06	.10	.09	.09	.09	.09	.06	.07	.07	.05	.04	.07	.02	.06

Table E.8

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights and MOS Threshold Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.22	.24	.02	.16	.12	.11	.20	.06	.10	.03	.06	.09	.05	.02	.00	.02	.00	.00	.06	.11	.00	.00	.00	.00	.00	.00
12B	.17	.14	.02	.26	.11	.10	.11	.10	.12	.06	.08	.10	.05	.02	.00	.02	.00	.00	.06	.11	.00	.00	.00	.00	.00	.00
13B	.11	.13	.02	.24	.04	.04	.04	.22	.17	.05	.11	.09	.02	.02	.00	.02	.00	.00	.07	.20	.00	.00	.00	.00	.00	.00
16S	.22	.22	.02	.19	.14	.12	.14	.07	.09	.03	.09	.07	.05	.02	.00	.02	.00	.00	.07	.08	.00	.00	.00	.00	.00	.00
19K	.19	.20	.01	.21	.08	.09	.17	.12	.14	.04	.07	.05	.01	.01	.00	.01	.00	.00	.08	.07	.00	.00	.00	.00	.00	.00
27E	.27	.27	.04	.15	.00	.07	.11	.15	.05	.05	.05	.07	.00	.02	.02	.02	.02	.02	.15	.00	.00	.13	.00	.02	.00	.00
31C	.33	.24	.03	.08	.06	.09	.13	.17	.10	.02	.06	.06	.00	.00	.00	.00	.00	.00	.06	.00	.00	.08	.00	.00	.00	.00
51B	.17	.17	.00	.29	.00	.00	.00	.29	.29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.29	.00	.00	.00	.00	.00	.00	.00
54B	.26	.22	.02	.13	.11	.09	.15	.19	.08	.00	.08	.00	.03	.03	.00	.03	.00	.00	.04	.03	.00	.00	.00	.00	.00	.00
55B	.57	.21	.00	.13	.00	.00	.00	.13	.13	.00	.13	.00	.00	.00	.00	.00	.00	.00	.13	.00	.00	.00	.00	.00	.00	.36
63B	.20	.28	.00	.17	.00	.05	.13	.14	.12	.04	.12	.12	.00	.00	.00	.00	.00	.00	.14	.04	.00	.00	.00	.00	.00	.00
67N	.39	.39	.00	.14	.00	.04	.04	.14	.00	.00	.00	.05	.00	.03	.03	.03	.03	.03	.14	.00	.00	.00	.00	.03	.00	.10
71L	.36	.39	.00	.00	.00	.14	.18	.00	.13	.05	.05	.13	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.17
76Y	.57	.34	.08	.00	.00	.13	.06	.00	.06	.00	.00	.06	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.42
88M	.30	.30	.00	.15	.00	.07	.07	.09	.18	.00	.18	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00
91A	.22	.45	.00	.00	.00	.00	.45	.00	.00	.00	.00	.14	.00	.00	.08	.00	.00	.08	.00	.00	.00	.00	.00	.08	.00	.00
94B	.29	.29	.53	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.53
95B	.25	.24	.02	.11	.09	.06	.21	.04	.11	.02	.06	.06	.06	.03	.08	.03	.02	.08	.04	.08	.03	.00	.00	.05	.00	.00

Table E.9

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights and MOS Threshold Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.23	.22	.01	.17	.13	.10	.19	.07	.10	.03	.06	.08	.04	.01	.00	.02	.00	.00	.05	.11	.00	.00	.00	.00	.00	.00
12B	.18	.13	.02	.26	.12	.09	.10	.11	.12	.07	.09	.10	.05	.02	.00	.02	.00	.00	.06	.11	.00	.00	.00	.00	.00	.00
13B	.12	.11	.02	.24	.04	.04	.04	.24	.17	.05	.11	.08	.02	.02	.00	.02	.00	.00	.07	.19	.00	.00	.00	.00	.00	.00
16S	.24	.20	.02	.19	.15	.12	.13	.08	.09	.03	.09	.06	.05	.02	.00	.02	.00	.00	.06	.08	.00	.00	.00	.00	.00	.00
19K	.20	.18	.01	.21	.08	.08	.16	.13	.15	.05	.07	.05	.01	.01	.00	.01	.00	.00	.08	.07	.00	.00	.00	.00	.00	.00
27E	.26	.26	.03	.15	.00	.06	.09	.21	.05	.05	.05	.08	.00	.02	.02	.01	.01	.02	.15	.00	.00	.15	.00	.02	.00	.00
31C	.34	.23	.03	.08	.05	.09	.12	.19	.10	.02	.06	.07	.00	.00	.00	.00	.00	.00	.06	.00	.00	.09	.00	.00	.00	.00
51B	.20	.13	.00	.31	.00	.00	.00	.29	.25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.30	.00	.00	.00	.00	.00	.00	.00
54B	.28	.20	.02	.15	.11	.08	.14	.20	.08	.00	.08	.00	.02	.02	.00	.02	.00	.00	.04	.03	.00	.00	.00	.00	.00	.00
55B	.61	.16	.00	.11	.00	.00	.00	.14	.16	.00	.12	.00	.00	.00	.00	.00	.00	.00	.15	.00	.00	.00	.00	.00	.00	.36
63B	.20	.26	.00	.17	.00	.04	.12	.19	.12	.04	.12	.11	.00	.00	.00	.00	.00	.00	.13	.04	.00	.00	.00	.00	.00	.00
67N	.42	.34	.00	.13	.00	.03	.04	.19	.00	.00	.00	.05	.00	.03	.03	.03	.03	.03	.13	.00	.00	.00	.00	.03	.00	.08
71L	.40	.34	.00	.00	.00	.16	.17	.00	.12	.06	.06	.14	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.16
76Y	.61	.29	.08	.00	.00	.14	.06	.00	.05	.00	.00	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.40
88M	.33	.26	.00	.16	.00	.06	.06	.11	.18	.00	.18	.00	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00
91A	.26	.46	.00	.00	.00	.00	.43	.00	.00	.00	.00	.13	.00	.00	.07	.00	.00	.07	.00	.00	.00	.00	.00	.08	.00	.00
94B	.36	.23	.51	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.57
95B	.27	.23	.02	.12	.09	.05	.19	.05	.11	.02	.06	.05	.06	.03	.08	.03	.02	.08	.04	.08	.03	.00	.00	.05	.00	.00

Table E.10

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and MOS Threshold Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.46	.34	.31
12B	.42	.33	.36
13B	.39	.32	.40
16S	.45	.33	.33
19K	.43	.33	.35
27E	.38	.29	.44
31C	.45	.32	.34
51B	.37	.34	.40
54B	.45	.33	.33
55B	.43	.32	.36
63B	.42	.30	.40
67N	.46	.28	.36
71L	.52	.33	.25
76Y	.53	.37	.19
88M	.44	.31	.36
91A	.55	.33	.21
94B	.49	.37	.24
95B	.51	.32	.28

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.11

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and Cluster Mean Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
12B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
13B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
16S	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
19K	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
27E	.14	.13	.10	.10	.10	.10	.11	.10	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.05	.05	.07	.05	.06	.02	.07
31C	.14	.13	.10	.10	.10	.10	.11	.10	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.05	.05	.07	.05	.06	.02	.07
51B	.13	.13	.09	.11	.10	.09	.11	.09	.08	.07	.06	.08	.05	.11	.07	.08	.09	.07	.08	.06	.05	.07	.04	.06	.02	.07
54B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
55B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.06	.05	.05	.06	.05	.06	.03	.08
63B	.13	.13	.09	.11	.10	.09	.11	.09	.08	.07	.06	.08	.05	.11	.07	.08	.09	.07	.08	.06	.05	.07	.04	.06	.02	.07
67N	.13	.13	.09	.11	.10	.09	.11	.09	.08	.07	.06	.08	.05	.11	.07	.08	.09	.07	.08	.06	.05	.07	.04	.06	.02	.07
71L	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.06	.05	.05	.06	.05	.06	.03	.08
76Y	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.06	.05	.05	.06	.05	.06	.03	.08
88M	.13	.13	.09	.11	.10	.09	.11	.09	.08	.07	.06	.08	.05	.11	.07	.08	.09	.07	.08	.06	.05	.07	.04	.06	.02	.07
91A	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.06	.05	.05	.06	.05	.06	.03	.08
94B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.06	.05	.05	.06	.05	.06	.03	.08
95B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.07	.06	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07

Table E.12

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights and Cluster Mean Component Weights

	Attribute																										
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
12B	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
13B	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
16S	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
19K	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
27E	.30	.29	.05	.12	.04	.07	.14	.11	.04	.03	.03	.07	.01	.04	.04	.03	.02	.03	.08	.02	.00	.06	.00	.03	.00	.04
31C	.30	.29	.05	.12	.04	.07	.14	.11	.04	.03	.03	.07	.01	.04	.04	.03	.02	.03	.08	.02	.00	.06	.00	.03	.00	.04
51B	.27	.26	.05	.14	.04	.06	.14	.12	.08	.02	.04	.07	.02	.03	.04	.02	.02	.03	.09	.04	.01	.02	.00	.03	.00	.04
54B	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
55B	.33	.30	.06	.10	.04	.07	.15	.06	.06	.02	.04	.07	.02	.05	.05	.03	.02	.04	.04	.03	.01	.02	.01	.03	.00	.07
63B	.27	.26	.05	.14	.04	.06	.14	.12	.08	.02	.04	.07	.02	.03	.04	.02	.02	.03	.09	.04	.01	.02	.00	.03	.00	.04
67N	.27	.26	.05	.14	.04	.06	.14	.12	.08	.02	.04	.07	.02	.03	.04	.02	.02	.03	.09	.04	.01	.02	.00	.03	.00	.04
71L	.33	.30	.06	.10	.04	.07	.15	.06	.06	.02	.04	.07	.02	.05	.05	.03	.02	.04	.04	.03	.01	.02	.01	.03	.00	.07
76Y	.33	.30	.06	.10	.04	.07	.15	.06	.06	.02	.04	.07	.02	.05	.05	.03	.02	.04	.04	.03	.01	.02	.01	.03	.00	.07
88M	.27	.26	.05	.14	.04	.06	.14	.12	.08	.02	.04	.07	.02	.03	.04	.02	.02	.03	.09	.04	.01	.02	.00	.03	.00	.04
91A	.33	.30	.06	.10	.04	.07	.15	.06	.06	.02	.04	.07	.02	.05	.05	.03	.02	.04	.04	.03	.01	.02	.01	.03	.00	.07
94B	.33	.30	.06	.10	.04	.07	.15	.06	.06	.02	.04	.07	.02	.05	.05	.03	.02	.04	.04	.03	.01	.02	.01	.03	.00	.07
95B	.26	.26	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.02	.04	.04	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02

Table E.13

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights and Cluster Mean Component Weights

MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
	Attribute																									
11B	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02
12B	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02
13B	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02
16S	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02
19K	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02
27E	.32	.28	.05	.12	.04	.06	.12	.13	.04	.02	.03	.07	.01	.03	.04	.02	.01	.03	.08	.02	.00	.06	.00	.03	.00	.04
31C	.32	.28	.05	.12	.04	.06	.12	.13	.04	.02	.03	.07	.01	.03	.04	.02	.01	.03	.08	.02	.00	.06	.00	.03	.00	.04
51B	.29	.25	.05	.14	.04	.06	.12	.14	.08	.02	.04	.07	.02	.03	.04	.02	.01	.03	.09	.04	.01	.02	.00	.03	.00	.04
54B	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02
55B	.35	.28	.06	.10	.04	.06	.13	.07	.06	.02	.04	.07	.02	.04	.05	.02	.01	.04	.04	.03	.01	.02	.00	.03	.00	.07
63B	.29	.25	.05	.14	.04	.06	.12	.14	.08	.02	.04	.07	.02	.03	.04	.02	.01	.03	.09	.04	.01	.02	.00	.03	.00	.04
67N	.29	.25	.05	.14	.04	.06	.12	.14	.08	.02	.04	.07	.02	.03	.04	.02	.01	.03	.09	.04	.01	.02	.00	.03	.00	.04
71L	.35	.28	.06	.10	.04	.06	.13	.07	.06	.02	.04	.07	.02	.04	.05	.02	.01	.04	.04	.03	.01	.02	.00	.03	.00	.07
76Y	.35	.28	.06	.10	.04	.06	.13	.07	.06	.02	.04	.07	.02	.04	.05	.02	.01	.04	.04	.03	.01	.02	.00	.03	.00	.07
88M	.29	.25	.05	.14	.04	.06	.12	.14	.08	.02	.04	.07	.02	.03	.04	.02	.01	.03	.09	.04	.01	.02	.00	.03	.00	.04
91A	.35	.28	.06	.10	.04	.06	.13	.07	.06	.02	.04	.07	.02	.04	.05	.02	.01	.04	.04	.03	.01	.02	.00	.03	.00	.07
94B	.35	.28	.06	.10	.04	.06	.13	.07	.06	.02	.04	.07	.02	.04	.05	.02	.01	.04	.04	.03	.01	.02	.00	.03	.00	.07
95B	.27	.25	.05	.14	.05	.06	.13	.11	.09	.03	.05	.07	.02	.03	.04	.02	.01	.04	.06	.06	.01	.02	.00	.03	.00	.02

Table E.14

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and Cluster Mean Component Weights, .95 Stepwise Reduction

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00
12B	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00
13B	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00
16S	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00
19K	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00
27E	.29	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
31C	.29	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
51B	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
54B	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00
55B	.29	.26	.00	.00	.00	.00	.19	.00	.00	.23	.00	.00	.00	.35	.00	.00	.00	.00	.16	.00	.00	.00	.00	.19	.00	.00
63B	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
67N	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
71L	.29	.26	.00	.00	.00	.00	.19	.00	.00	.23	.00	.00	.00	.35	.00	.00	.00	.00	.16	.00	.00	.00	.00	.19	.00	.00
76Y	.29	.26	.00	.00	.00	.00	.19	.00	.00	.23	.00	.00	.00	.35	.00	.00	.00	.00	.16	.00	.00	.00	.00	.19	.00	.00
88M	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
91A	.29	.26	.00	.00	.00	.00	.19	.00	.00	.23	.00	.00	.00	.35	.00	.00	.00	.00	.16	.00	.00	.00	.00	.19	.00	.00
94B	.29	.26	.00	.00	.00	.00	.19	.00	.00	.23	.00	.00	.00	.35	.00	.00	.00	.00	.16	.00	.00	.00	.00	.19	.00	.00
95B	.20	.26	.18	.00	.00	.00	.16	.00	.21	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.15	.20	.00	.00	.00	.00

Table E.15

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and Cluster Mean Component Weights, Top 5 Stepwise Reduction

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
12B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
13B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
16S	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
19K	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
27E	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
31C	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
51B	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
54B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
55B	.26	.31	.00	.00	.00	.00	.00	.00	.00	.29	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
63B	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
67N	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
71L	.26	.31	.00	.00	.00	.00	.00	.00	.00	.29	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
76Y	.26	.31	.00	.00	.00	.00	.00	.00	.00	.29	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
88M	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
91A	.26	.31	.00	.00	.00	.00	.00	.00	.00	.29	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
94B	.26	.31	.00	.00	.00	.00	.00	.00	.00	.29	.00	.00	.00	.36	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
95B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00

Table E.16

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and Cluster Mean Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.46	.33	.31
12B	.46	.33	.31
13B	.46	.33	.31
16S	.46	.33	.31
19K	.46	.33	.31
27E	.46	.32	.32
31C	.46	.32	.32
51B	.46	.33	.33
54B	.46	.33	.31
55B	.49	.33	.28
63B	.46	.33	.33
67N	.46	.33	.33
71L	.49	.33	.28
76Y	.49	.33	.28
88M	.46	.33	.33
91A	.49	.33	.28
94B	.49	.33	.28
95B	.46	.33	.31

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.17

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and Cluster Threshold Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06
12B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06
13B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06
16S	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06
19K	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06
27E	.14	.13	.10	.11	.10	.10	.10	.14	.07	.08	.05	.09	.04	.09	.04	.06	.08	.05	.10	.04	.04	.12	.06	.03	.01	.07
31C	.14	.13	.10	.11	.10	.10	.10	.14	.07	.08	.05	.09	.04	.09	.04	.06	.08	.05	.10	.04	.04	.12	.06	.03	.01	.07
51B	.15	.12	.09	.10	.10	.11	.10	.12	.09	.08	.08	.07	.04	.10	.05	.07	.09	.05	.10	.05	.05	.09	.05	.04	.01	.07
54B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06
55B	.23	.15	.12	.09	.10	.10	.11	.09	.04	.04	.04	.04	.04	.11	.04	.06	.07	.05	.04	.01	.04	.11	.08	.04	.02	.08
63B	.15	.12	.09	.10	.10	.11	.10	.12	.09	.08	.08	.07	.04	.10	.05	.07	.09	.05	.10	.05	.05	.09	.05	.04	.01	.07
67N	.15	.12	.09	.10	.10	.11	.10	.12	.09	.08	.08	.07	.04	.10	.05	.07	.09	.05	.10	.05	.05	.09	.05	.04	.01	.07
71L	.23	.15	.12	.09	.10	.10	.11	.09	.04	.04	.04	.04	.04	.11	.04	.06	.07	.05	.04	.01	.04	.11	.08	.04	.02	.08
76Y	.23	.15	.12	.09	.10	.10	.11	.09	.04	.04	.04	.04	.04	.11	.04	.06	.07	.05	.04	.01	.04	.11	.08	.04	.02	.08
88M	.15	.12	.09	.10	.10	.11	.10	.12	.09	.08	.08	.07	.04	.10	.05	.07	.09	.05	.10	.05	.05	.09	.05	.04	.01	.07
91A	.23	.15	.12	.09	.10	.10	.11	.09	.04	.04	.04	.04	.04	.11	.04	.06	.07	.05	.04	.01	.04	.11	.08	.04	.02	.08
94B	.23	.15	.12	.09	.10	.10	.11	.09	.04	.04	.04	.04	.04	.11	.04	.06	.07	.05	.04	.01	.04	.11	.08	.04	.02	.08
95B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.07	.09	.06	.08	.07	.06	.07	.05	.04	.02	.06

Table E.18

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights and Cluster Threshold Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
12B	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
13B	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
16S	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
19K	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
27E	.34	.34	.06	.14	.00	.06	.09	.14	.00	.04	.00	.04	.00	.00	.00	.00	.00	.00	.14	.00	.00	.19	.00	.00	.00	.00
31C	.34	.34	.06	.14	.00	.06	.09	.14	.00	.04	.00	.04	.00	.00	.00	.00	.00	.00	.14	.00	.00	.19	.00	.00	.00	.00
51B	.33	.33	.00	.11	.00	.00	.00	.11	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
54B	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
55B	.56	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
63B	.33	.33	.00	.11	.00	.00	.00	.11	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
67N	.33	.33	.00	.11	.00	.00	.00	.11	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
71L	.56	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
76Y	.56	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
88M	.33	.33	.00	.11	.00	.00	.00	.11	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
91A	.56	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
94B	.56	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
95B	.21	.24	.02	.16	.10	.08	.20	.08	.10	.04	.10	.08	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00

Table E.19

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights and Cluster Threshold Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
12B	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
13B	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
16S	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
19K	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
27E	.34	.32	.05	.13	.00	.05	.08	.19	.00	.03	.00	.04	.00	.00	.00	.00	.00	.00	.13	.00	.00	.20	.00	.00	.00	.00
31C	.34	.32	.05	.13	.00	.05	.08	.19	.00	.03	.00	.04	.00	.00	.00	.00	.00	.00	.13	.00	.00	.20	.00	.00	.00	.00
51B	.38	.27	.00	.09	.00	.00	.00	.14	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
54B	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
55B	.67	.44	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
63B	.38	.27	.00	.09	.00	.00	.00	.14	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
67N	.38	.27	.00	.09	.00	.00	.00	.14	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
71L	.67	.44	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
76Y	.67	.44	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
88M	.38	.27	.00	.09	.00	.00	.00	.14	.21	.00	.21	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00	.00
91A	.67	.44	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
94B	.67	.44	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
95B	.22	.23	.02	.17	.10	.07	.19	.10	.10	.04	.10	.07	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00

Table E.20

Normalized Attribute Weights for 18 MOS: Core Technical Proficiency, Mean Attribute Validities and Cluster Threshold Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.44	.33	.34
12B	.44	.33	.34
13B	.44	.33	.34
16S	.44	.33	.34
19K	.44	.33	.34
27E	.39	.30	.42
31C	.39	.30	.42
51B	.45	.27	.38
54B	.44	.33	.34
55B	.59	.29	.21
63B	.45	.27	.38
67N	.45	.27	.38
71L	.59	.29	.21
76Y	.59	.29	.21
88M	.45	.27	.38
91A	.59	.29	.21
94B	.59	.29	.21
95B	.44	.33	.34

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.21

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and MOS Mean Component Weights

MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.13	.13	.09	.11	.10	.10	.11	.08	.08	.07	.07	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
12B	.13	.13	.09	.11	.10	.09	.11	.08	.08	.07	.07	.07	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
13B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
16S	.13	.13	.09	.11	.10	.10	.11	.08	.07	.07	.06	.07	.05	.10	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
19K	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.08	.07	.06	.07	.04	.05	.02	.07
27E	.13	.13	.09	.10	.10	.09	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
31C	.14	.13	.10	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
51B	.13	.12	.09	.11	.10	.09	.10	.09	.08	.08	.06	.08	.06	.11	.07	.08	.09	.07	.08	.07	.06	.06	.04	.06	.02	.07
54B	.13	.13	.09	.10	.10	.10	.11	.08	.08	.07	.06	.07	.05	.11	.07	.08	.09	.07	.07	.06	.06	.06	.05	.06	.02	.07
55B	.13	.13	.09	.10	.10	.10	.11	.08	.08	.07	.06	.07	.06	.11	.08	.09	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
63B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.08	.06	.08	.05	.10	.07	.08	.09	.07	.08	.06	.06	.07	.04	.06	.02	.07
67N	.14	.13	.09	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.11	.07	.08	.09	.07	.07	.06	.06	.07	.04	.06	.02	.07
71L	.15	.13	.10	.09	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.09	.09	.08	.06	.05	.06	.06	.04	.06	.03	.08
76Y	.14	.13	.10	.10	.10	.10	.11	.08	.08	.07	.06	.08	.05	.11	.07	.08	.10	.07	.07	.05	.05	.06	.04	.06	.02	.08
88M	.13	.13	.09	.10	.10	.10	.11	.09	.08	.07	.06	.07	.06	.11	.07	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.07
91A	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.05	.06	.06	.05	.06	.02	.07
94B	.14	.13	.10	.10	.10	.10	.11	.08	.08	.07	.06	.07	.05	.11	.08	.09	.10	.07	.07	.06	.06	.06	.04	.06	.02	.08
95B	.14	.13	.09	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.08	.06	.06	.06	.06	.04	.06	.02	.07

Table E.22

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-1 Attribute Weights and MOS Mean Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.25	.25	.05	.14	.06	.07	.16	.08	.09	.03	.05	.08	.03	.04	.05	.03	.02	.04	.06	.07	.01	.02	.00	.03	.00	.02
12B	.25	.25	.05	.15	.05	.06	.14	.11	.11	.03	.06	.07	.03	.04	.05	.03	.02	.04	.08	.06	.01	.02	.00	.03	.00	.02
13B	.24	.24	.05	.14	.05	.06	.14	.12	.10	.03	.05	.08	.02	.04	.04	.03	.02	.04	.07	.08	.01	.02	.00	.03	.00	.03
16S	.26	.27	.05	.14	.06	.07	.16	.08	.07	.02	.05	.07	.02	.04	.04	.03	.02	.04	.06	.05	.01	.02	.00	.03	.00	.02
19K	.24	.24	.05	.15	.05	.08	.15	.12	.09	.03	.05	.08	.02	.03	.04	.02	.01	.03	.08	.07	.01	.03	.00	.02	.00	.02
27E	.28	.29	.05	.13	.04	.07	.15	.10	.05	.03	.04	.07	.02	.04	.04	.03	.02	.04	.08	.04	.01	.04	.00	.03	.00	.04
31C	.28	.28	.05	.12	.05	.07	.15	.10	.06	.02	.04	.07	.02	.04	.04	.03	.02	.04	.07	.04	.01	.04	.01	.03	.00	.03
51B	.23	.23	.04	.17	.04	.05	.13	.15	.11	.03	.04	.08	.02	.04	.04	.03	.02	.04	.11	.05	.01	.01	.00	.03	.00	.02
54B	.28	.28	.05	.13	.05	.06	.15	.09	.07	.02	.04	.07	.02	.04	.04	.03	.02	.04	.06	.05	.01	.02	.01	.03	.00	.03
55B	.29	.26	.04	.12	.04	.06	.15	.09	.09	.03	.06	.07	.02	.04	.05	.03	.02	.04	.06	.05	.01	.01	.00	.03	.00	.06
63B	.26	.26	.05	.14	.04	.07	.15	.12	.08	.03	.05	.08	.02	.03	.04	.02	.01	.03	.09	.05	.01	.03	.00	.02	.00	.04
67N	.29	.28	.05	.14	.04	.07	.15	.10	.06	.02	.03	.07	.02	.04	.04	.03	.02	.04	.08	.04	.01	.03	.00	.03	.00	.05
71L	.33	.30	.03	.09	.05	.08	.16	.05	.07	.02	.04	.07	.03	.05	.06	.03	.02	.04	.04	.05	.01	.03	.00	.03	.00	.07
76Y	.32	.29	.05	.11	.04	.07	.14	.08	.07	.02	.04	.08	.02	.04	.04	.02	.02	.03	.06	.04	.01	.02	.00	.03	.00	.08
88M	.28	.27	.04	.13	.05	.07	.16	.08	.09	.02	.06	.07	.02	.04	.04	.03	.02	.04	.06	.05	.01	.01	.00	.03	.00	.04
91A	.30	.28	.05	.11	.05	.07	.16	.08	.07	.02	.04	.09	.02	.04	.06	.02	.02	.04	.06	.04	.01	.02	.00	.03	.00	.0[illegible]
94B	.30	.28	.09	.11	.04	.07	.14	.08	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.01	.00	.03	.00	.10
95B	.29	.28	.04	.12	.06	.07	.17	.06	.08	.02	.04	.06	.03	.04	.06	.03	.02	.05	.04	.05	.01	.02	.00	.04	.00	.03

Table E.23

Normalized Attribute Weights for 18 MOS: Overall Job Performance, 0-Mean Attribute Weights and MOS Mean Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.27	.24	.04	.14	.06	.06	.14	.10	.09	.03	.05	.08	.03	.03	.04	.02	.01	.04	.06	.07	.01	.02	.00	.03	.00	.02
12B	.26	.24	.05	.15	.05	.05	.13	.11	.11	.03	.06	.07	.03	.03	.05	.03	.02	.04	.08	.05	.01	.02	.00	.03	.00	.02
13B	.25	.23	.05	.14	.05	.06	.12	.13	.10	.03	.05	.08	.02	.03	.04	.02	.01	.04	.07	.08	.01	.02	.00	.03	.00	.02
16S	.28	.26	.04	.14	.06	.07	.14	.10	.07	.03	.05	.07	.02	.04	.04	.03	.02	.04	.06	.05	.01	.02	.00	.03	.00	.02
19K	.25	.23	.05	.15	.05	.07	.13	.13	.09	.04	.05	.08	.02	.02		.02	.01	.03	.08	.06	.01	.03	.00	.02	.00	.02
27E	.30	.27	.04	.13	.04	.06	.13	.12	.06	.03	.04	.07	.02	.03	.04	.02	.01	.04	.07	.04	.01	.05	.00	.03	.00	.03
31C	.30	.27	.05	.13	.05	.07	.13	.11	.06	.02	.04	.07	.02	.04	.04	.02	.01	.04	.06	.04	.01	.04	.00	.03	.00	.03
51B	.24	.22	.04	.17	.04	.05	.11	.16	.11	.03	.04	.08	.02	.03	.04	.02	.01	.04	.11	.05	.01	.01	.00	.03	.00	.02
54B	.30	.27	.05	.13	.05	.06	.13	.10	.07	.02	.04	.07	.02	.03	.04	.02	.01	.04	.05	.05	.01	.02	.01	.03	.00	.03
55B	.31	.25	.04	.13	.05	.06	.13	.10	.10	.03	.05	.07	.02	.04	.05	.03	.02	.04	.06	.05	.01	.01	.00	.03	.00	.06
63B	.27	.24	.05	.14	.04	.06	.13	.13	.09	.03	.05	.08	.02	.03	.03	.02	.01	.03	.08	.05	.01	.03	.00	.02	.00	.04
67N	.31	.27	.05	.14	.04	.06	.13	.12	.06	.02	.03	.07	.02	.03	.04	.02	.01	.04	.07	.04	.01	.03	.00	.03	.00	.05
71L	.36	.28	.04	.09	.05	.08	.14	.06	.07	.02	.04	.07	.03	.04	.06	.02	.01	.04	.03	.05	.01	.04	.00	.03	.00	.07
76Y	.34	.28	.05	.11	.04	.07	.12	.09	.07	.02	.04	.07	.02	.04	.04	.02	.01	.03	.06	.04	.01	.02	.00	.03	.00	.08
88M	.30	.26	.04	.14	.05	.06	.14	.09	.09	.02	.06	.06	.02	.03	.04	.02	.01	.04	.06	.05	.01	.01	.00	.03	.00	.04
91A	.32	.27	.05	.11	.05	.06	.15	.09	.07	.02	.04	.09	.02	.03	.06	.02	.01	.04	.06	.04	.01	.02	.00	.03	.00	.04
94B	.32	.26	.09	.11	.04	.06	.12	.09	.07	.02	.04	.06	.02	.04	.05	.03	.02	.04	.05	.04	.01	.01	.00	.03	.00	.10
95B	.31	.27	.04	.12	.06	.06	.15	.07	.08	.02	.04	.06	.03	.04	.06	.02	.01	.05	.04	.05	.01	.02	.00	.04	.00	.02

Table E.24

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and MOS Mean Component Weights, .95 Stepwise Reduction

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.26	.00	.00	.31	.00	.00	.19	.00	.18	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.14	.00	.19	.00	.00	.00	.00
12B	.26	.00	.00	.31	.00	.00	.19	.00	.18	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.14	.00	.19	.00	.00	.00	.00
13B	.30	.00	.00	.31	.00	.00	.19	.00	.19	.00	.00	.00	.00	.39	.00	.00	.00	.00	.14	.00	.00	.18	.00	.00	.00	.00
16S	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
19K	.27	.00	.00	.33	.00	.00	.19	.00	.19	.00	.00	.00	.00	.34	.00	.00	.00	.00	.19	.00	.00	.00	.00	.19	.00	.00
27E	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
31C	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
51B	.24	.00	.00	.28	.00	.00	.19	.00	.00	.22	.00	.00	.00	.38	.00	.00	.00	.00	.00	.13	.00	.19	.00	.00	.00	.00
54B	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
55B	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.36	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
63B	.28	.00	.00	.33	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
67N	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
71L	.31	.29	.00	.00	.00	.00	.19	.00	.20	.00	.00	.00	.00	.36	.00	.00	.00	.00	.17	.00	.00	.00	.00	.19	.00	.00
76Y	.31	.29	.00	.00	.00	.00	.19	.00	.21	.00	.00	.00	.00	.35	.00	.00	.00	.00	.19	.00	.00	.00	.00	.19	.00	.00
88M	.28	.00	.00	.32	.00	.00	.19	.00	.19	.00	.00	.00	.00	.35	.00	.00	.00	.00	.17	.00	.00	.00	.00	.20	.00	.00
91A	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
94B	.28	.00	.00	.31	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
95B	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00

Table E.25

Normalized Attribute Weights for 18 MOS: ***Overall Performance,*** **Mean Attribute Validities and MOS Mean Component Weights, Top 5 Stepwise Reduction**

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.27	.00	.00	.38	.00	.00	.00	.00	.22	.00	.00	.00	.00	.41	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
12B	.27	.00	.00	.38	.00	.00	.00	.00	.22	.00	.00	.00	.00	.41	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
13B	.27	.00	.00	.38	.00	.00	.00	.00	.22	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
16S	.33	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
19K	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
27E	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
31C	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
51B	.26	.00	.00	.34	.00	.00	.00	.00	.00	.26	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00
54B	.33	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
55B	.00	.00	.00	.47	.00	.00	.19	.00	.22	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.24	.00	.00
63B	.33	.00	.00	.37	.00	.00	.21	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
67N	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
71L	.27	.34	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
76Y	.37	.33	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.23	.00	.00	.00	.00	.00	.00	.00
88M	.33	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00	.00
91A	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
94B	.00	.00	.00	.47	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
95B	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00

Table E.26

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and MOS Mean Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.47	.33	.31
12B	.46	.33	.31
13B	.45	.33	.33
16S	.47	.33	.30
19K	.45	.33	.33
27E	.46	.32	.32
31C	.47	.33	.31
51B	.45	.33	.33
54B	.47	.33	.30
55B	.47	.33	.30
63B	.45	.33	.33
67N	.47	.33	.32
71L	.50	.33	.27
76Y	.48	.33	.29
88M	.47	.33	.31
91A	.48	.33	.29
94B	.48	.34	.29
95B	.49	.33	.28

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.27

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and MOS Threshold Component Weights

MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
	Attribute																									
11B	.12	.12	.09	.11	.11	.11	.11	.08	.09	.08	.08	.08	.06	.10	.06	.08	.09	.06	.07	.08	.07	.06	.04	.05	.02	.06
12B	.12	.12	.08	.11	.10	.10	.11	.08	.08	.08	.07	.08	.06	.10	.08	.08	.09	.08	.07	.08	.06	.06	.04	.06	.02	.06
13B	.11	.12	.09	.11	.10	.10	.10	.10	.09	.08	.07	.08	.06	.10	.07	.08	.09	.06	.08	.09	.07	.06	.04	.05	.01	.06
16S	.12	.12	.08	.11	.11	.10	.11	.08	.08	.08	.07	.07	.06	.10	.07	.08	.09	.07	.07	.08	.06	.06	.04	.06	.02	.06
19K	.12	.12	.09	.11	.11	.10	.11	.09	.09	.08	.07	.08	.06	.10	.06	.08	.09	.06	.08	.08	.06	.07	.04	.05	.01	.06
27E	.13	.12	.09	.10	.10	.10	.10	.10	.08	.08	.07	.08	.05	.10	.07	.08	.09	.07	.08	.06	.06	.08	.05	.05	.01	.07
31C	.13	.13	.09	.10	.10	.10	.11	.09	.08	.08	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
51B	.11	.12	.09	.11	.09	.09	.10	.10	.09	.08	.07	.08	.06	.11	.07	.08	.09	.06	.09	.08	.06	.07	.04	.05	.01	.06
54B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.05	.10	.06	.08	.09	.06	.08	.08	.07	.07	.04	.04	.02	.06
55B	.13	.12	.09	.10	.10	.10	.11	.11	.09	.08	.07	.09	.05	.11	.06	.08	.10	.06	.09	.07	.06	.07	.04	.04	.01	.08
63B	.12	.12	.08	.11	.10	.10	.11	.12	.09	.09	.07	.09	.05	.10	.06	.07	.09	.05	.09	.07	.06	.08	.05	.04	.01	.07
67N	.14	.13	.09	.10	.09	.09	.10	.11	.07	.08	.06	.08	.05	.11	.06	.07	.09	.06	.08	.05	.05	.08	.05	.05	.01	.08
71L	.16	.13	.10	.08	.10	.13	.11	.07	.09	.09	.06	.10	.04	.11	.06	.08	.10	.05	.05	.03	.05	.06	.05	.04	.03	.10
76Y	.14	.13	.11	.09	.09	.12	.11	.08	.08	.08	.06	.08	.05	.11	.06	.08	.11	.06	.07	.05	.06	.06	.04	.04	.01	.12
88M	.12	.12	.08	.11	.10	.10	.10	.10	.09	.09	.08	.09	.05	.10	.06	.07	.09	.06	.09	.07	.06	.08	.05	.04	.01	.07
91A	.11	.12	.09	.11	.10	.10	.11	.09	.09	.09	.08	.09	.05	.10	.07	.08	.09	.06	.08	.08	.07	.07	.05	.04	.02	.06
94B	.13	.12	.09	.09	.10	.09	.11	.09	.09	.08	.07	.09	.06	.11	.08	.09	.10	.07	.07	.06	.07	.06	.04	.05	.03	.08
95B	.13	.12	.08	.10	.11	.10	.11	.07	.08	.07	.07	.07	.06	.10	.08	.09	.09	.08	.06	.07	.07	.06	.04	.07	.02	.06

Table E.28

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-1 Attribute Weights and MOS Threshold Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.22	.24	.02	.16	.12	.11	.20	.06	.10	.03	.06	.09	.05	.02	.00	.02	.00	.00	.06	.11	.00	.00	.00	.00	.00	.00
12B	.20	.22	.03	.19	.08	.07	.15	.07	.10	.04	.08	.10	.04	.04	.04	.04	.02	.04	.05	.10	.00	.00	.00	.04	.00	.00
13B	.12	.19	.03	.22	.05	.05	.11	.17	.13	.04	.09	.08	.02	.03	.01	.03	.01	.01	.06	.15	.00	.00	.00	.01	.00	.00
16S	.21	.26	.02	.17	.13	.11	.17	.06	.08	.03	.08	.06	.05	.03	.01	.03	.01	.01	.06	.07	.00	.00	.00	.01	.00	.00
19K	.19	.24	.01	.16	.09	.10	.16	.13	.11	.05	.08	.06	.02	.02	.00	.02	.00	.00	.09	.08	.00	.00	.00	.00	.00	.00
27E	.24	.32	.02	.13	.02	.07	.13	.09	.08	.04	.08	.08	.02	.04	.02	.04	.02	.02	.09	.05	.00	.07	.00	.02	.00	.00
31C	.26	.26	.03	.10	.06	.08	.16	.12	.08	.03	.06	.08	.01	.05	.03	.05	.03	.03	.06	.03	.00	.04	.00	.03	.00	.00
51B	.13	.22	.00	.21	.02	.05	.11	.17	.19	.03	.10	.08	.02	.04	.02	.04	.02	.02	.17	.05	.00	.00	.00	.02	.00	.00
54B	.19	.23	.02	.24	.09	.07	.18	.08	.09	.03	.09	.07	.02	.02	.00	.02	.00	.00	.08	.05	.00	.00	.00	.00	.00	.00
55B	.30	.25	.00	.17	.00	.00	.11	.17	.11	.05	.11	.12	.00	.00	.00	.00	.00	.00	.17	.05	.00	.00	.00	.00	.00	.15
63B	.20	.28	.00	.17	.00	.05	.13	.14	.12	.04	.12	.12	.00	.00	.00	.00	.00	.00	.14	.04	.00	.00	.00	.00	.00	.00
67N	.35	.35	.00	.13	.00	.04	.04	.13	.05	.05	.05	.09	.00	.03	.03	.03	.03	.03	.13	.05	.00	.00	.00	.03	.00	.08
71L	.36	.39	.00	.00	.00	.14	.18	.00	.13	.05	.05	.13	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.17
76Y	.44	.26	.08	.08	.00	.07	.07	.08	.06	.06	.06	.14	.00	.00	.00	.00	.00	.00	.08	.06	.00	.00	.00	.00	.00	.44
88M	.19	.28	.00	.16	.00	.04	.14	.12	.16	.05	.16	.11	.00	.00	.00	.00	.00	.00	.12	.05	.00	.00	.00	.00	.00	.00
91A	.14	.26	.02	.17	.05	.08	.22	.09	.11	.04	.11	.14	.02	.02	.00	.02	.00	.00	.09	.06	.00	.00	.00	.00	.00	.00
94B	.16	.29	.21	.09	.00	.00	.12	.09	.07	.07	.07	.16	.00	.04	.04	.04	.04	.04	.09	.07	.00	.00	.00	.04	.00	.21
95B	.23	.23	.03	.13	.10	.07	.22	.05	.09	.02	.06	.07	.04	.03	.07	.03	.01	.07	.05	.06	.03	.00	.00	.04	.00	.00

Table E.29

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-Mean Attribute Weights and MOS Threshold Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.23	.22	.01	.17	.13	.10	.19	.07	.10	.03	.06	.08	.04	.01	.00	.02	.00	.00	.05	.11	.00	.00	.00	.00	.00	.00
12B	.22	.21	.02	.20	.08	.06	.14	.07	.10	.04	.08	.10	.03	.03	.04	.03	.02	.04	.04	.10	.00	.00	.00	.04	.00	.00
13B	.13	.18	.03	.22	.05	.05	.10	.19	.14	.05	.10	.07	.01	.03	.02	.03	.01	.02	.06	.15	.00	.00	.00	.01	.00	.00
16S	.22	.24	.01	.17	.13	.10	.16	.07	.08	.03	.08	.05	.04	.03	.02	.03	.01	.02	.06	.07	.00	.00	.00	.02	.00	.00
19K	.20	.22	.01	.16	.09	.09	.15	.14	.12	.05	.08	.05	.01	.01	.00	.01	.00	.00	.09	.08	.00	.00	.00	.00	.00	.00
27E	.26	.29	.01	.13	.02	.06	.12	.12	.08	.05	.09	.08	.01	.03	.02	.03	.02	.02	.09	.05	.00	.08	.00	.02	.00	.00
31C	.28	.25	.02	.10	.06	.07	.14	.13	.08	.03	.06	.08	.01	.04	.03	.04	.03	.04	.05	.03	.00	.05	.00	.03	.00	.00
51B	.14	.20	.00	.22	.02	.04	.11	.18	.18	.04	.10	.07	.02	.04	.02	.04	.02	.02	.16	.06	.00	.00	.00	.02	.00	.00
54B	.20	.21	.02	.25	.09	.06	.17	.09	.09	.03	.10	.07	.02	.02	.00	.02	.00	.00	.07	.05	.00	.00	.00	.00	.00	.00
55B	.32	.23	.00	.15	.00	.00	.11	.20	.11	.06	.10	.11	.00	.00	.00	.00	.00	.00	.17	.05	.00	.00	.00	.00	.00	.15
63B	.20	.26	.00	.17	.00	.04	.12	.19	.12	.04	.12	.11	.00	.00	.00	.00	.00	.00	.13	.04	.00	.00	.00	.00	.00	.00
67N	.37	.30	.00	.11	.00	.03	.03	.17	.04	.05	.05	.08	.00	.03	.03	.03	.03	.03	.12	.04	.00	.00	.00	.03	.00	.07
71L	.40	.34	.00	.00	.00	.16	.17	.00	.12	.06	.06	.14	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.16
76Y	.46	.23	.09	.07	.00	.08	.06	.10	.05	.06	.06	.12	.00	.00	.00	.00	.00	.00	.07	.05	.00	.00	.00	.00	.00	.42
88M	.20	.26	.00	.16	.00	.03	.13	.15	.16	.05	.16	.10	.00	.00	.00	.00	.00	.00	.11	.04	.00	.00	.00	.00	.00	.00
91A	.14	.26	.02	.17	.05	.07	.21	.11	.11	.04	.12	.12	.02	.02	.00	.02	.00	.00	.08	.06	.00	.00	.00	.00	.00	.00
94B	.19	.26	.20	.08	.00	.00	.13	.11	.07	.08	.08	.14	.00	.05	.04	.04	.04	.04	.08	.06	.00	.00	.00	.04	.00	.23
95B	.25	.22	.02	.14	.10	.06	.21	.06	.10	.03	.07	.06	.03	.03	.07	.02	.01	.07	.05	.06	.03	.00	.00	.04	.00	.00

Table E.30

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Valdities and MOS Threshold Component Weights, ASVAB Reduction

MOS	Attribute		
	Verb[1]	Numb[2]	Mech[3]
11B	.46	.34	.31
12B	.46	.33	.32
13B	.41	.33	.37
16S	.47	.33	.31
19K	.43	.33	.35
27E	.44	.31	.36
31C	.47	.32	.31
51B	.41	.32	.38
54B	.44	.33	.34
55B	.42	.31	.38
63B	.42	.30	.40
67N	.45	.30	.37
71L	.52	.33	.25
76Y	.46	.36	.29
88M	.43	.31	.37
91A	.42	.34	.35
94B	.45	.33	.32
95B	.49	.32	.29

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.31

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and Cluster Mean Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
12B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
13B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
16S	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
19K	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
27E	.14	.13	.09	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
31C	.14	.13	.09	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
51B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
54B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07
55B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
63B	.14	.13	.09	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
67N	.14	.13	.09	.10	.10	.10	.11	.09	.07	.07	.06	.08	.05	.10	.07	.08	.09	.07	.07	.06	.06	.07	.05	.06	.02	.07
71L	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
76Y	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
88M	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
91A	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
94B	.14	.13	.10	.10	.10	.10	.11	.08	.07	.07	.06	.07	.05	.11	.08	.08	.09	.07	.07	.06	.06	.06	.04	.06	.02	.08
95B	.13	.13	.09	.11	.10	.10	.11	.09	.08	.07	.06	.08	.06	.10	.07	.08	.09	.07	.07	.07	.06	.06	.04	.06	.02	.07

Table E.32

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-1 Attribute Weights and Cluster Mean Component Weights

MOS	Attribute																								
	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
12B	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
13B	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
16S	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
19K	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
27E	.28	.28	.05	.13	.04	.07	.15	.10	.06	.03	.04	.07	.02	.04	.04	.03	.02	.04	.08	.04	.01	.04	.00	.03	.00	.04
31C	.28	.28	.05	.13	.04	.07	.15	.10	.06	.03	.04	.07	.02	.04	.04	.03	.02	.04	.08	.04	.01	.04	.00	.03	.00	.04
51B	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
54B	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02
55B	.30	.28	.05	.11	.04	.07	.15	.07	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.02	.01	.03	.00	.06
63B	.28	.28	.05	.13	.04	.07	.15	.10	.06	.03	.04	.07	.02	.04	.04	.03	.02	.04	.08	.04	.01	.04	.00	.03	.00	.04
67N	.28	.28	.05	.13	.04	.07	.15	.10	.06	.03	.04	.07	.02	.04	.04	.03	.02	.04	.08	.04	.01	.04	.00	.03	.00	.04
71L	.30	.28	.05	.11	.04	.07	.15	.07	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.02	.01	.03	.00	.06
76Y	.30	.28	.05	.11	.04	.07	.15	.07	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.02	.01	.03	.00	.06
88M	.30	.28	.05	.11	.04	.07	.15	.07	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.02	.01	.03	.00	.06
91A	.30	.28	.05	.11	.04	.07	.15	.07	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.02	.01	.03	.00	.06
94B	.30	.28	.05	.11	.04	.07	.15	.07	.07	.02	.04	.07	.02	.04	.05	.03	.02	.04	.05	.04	.01	.02	.01	.03	.00	.06
95B	.25	.25	.05	.14	.05	.07	.15	.10	.09	.03	.05	.07	.03	.04	.05	.03	.02	.04	.07	.06	.01	.02	.00	.03	.00	.02

Table E.33

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-Mean Attribute Weights and Cluster Mean Component Weights

	Attribute																							
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
12B	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
13B	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
16S	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
19K	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
27E	.30	.27	.05	.13	.04	.06	.13	.12	.06	.03	.04	.07	.02	.03	.04	.02	.01	.04	.07	.04	.01	.04	.00	.03	.00	.03
31C	.30	.27	.05	.13	.04	.06	.13	.12	.06	.03	.04	.07	.02	.03	.04	.02	.01	.04	.07	.04	.01	.04	.00	.03	.00	.03
51B	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
54B	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02
55B	.33	.27	.05	.11	.04	.06	.13	.08	.07	.02	.04	.07	.02	.04	.05	.02	.01	.04	.05	.04	.01	.02	.00	.03	.00	.06
63B	.30	.27	.05	.13	.04	.06	.13	.12	.06	.03	.04	.07	.02	.03	.04	.02	.01	.04	.07	.04	.01	.04	.00	.03	.00	.03
67N	.30	.27	.05	.13	.04	.06	.13	.12	.06	.03	.04	.07	.02	.03	.04	.02	.01	.04	.07	.04	.01	.04	.00	.03	.00	.03
71L	.33	.27	.05	.11	.04	.06	.13	.08	.07	.02	.04	.07	.02	.04	.05	.02	.01	.04	.05	.04	.01	.02	.00	.03	.00	.06
76Y	.33	.27	.05	.11	.04	.06	.13	.08	.07	.02	.04	.07	.02	.04	.05	.02	.01	.04	.05	.04	.01	.02	.00	.03	.00	.06
88M	.33	.27	.05	.11	.04	.06	.13	.08	.07	.02	.04	.07	.02	.04	.05	.02	.01	.04	.05	.04	.01	.02	.00	.03	.00	.06
91A	.33	.27	.05	.11	.04	.06	.13	.08	.07	.02	.04	.07	.02	.04	.05	.02	.01	.04	.05	.04	.01	.02	.00	.03	.00	.06
94B	.33	.27	.05	.11	.04	.06	.13	.08	.07	.02	.04	.07	.02	.04	.05	.02	.01	.04	.05	.04	.01	.02	.00	.03	.00	.06
95B	.27	.25	.05	.15	.05	.06	.13	.11	.09	.03	.05	.07	.03	.03	.04	.02	.01	.04	.07	.06	.01	.02	.00	.03	.00	.02

Table E.34

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and Cluster Mean Component Weights, .95 Stepwise Reduction

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
12B	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
13B	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
16S	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
19K	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
27E	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
31C	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
51B	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
54B	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00
55B	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
63B	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
67N	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.35	.00	.00	.00	.00	.18	.00	.00	.00	.00	.20	.00	.00
71L	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
76Y	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
88M	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
91A	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
94B	.28	.00	.00	.32	.00	.00	.19	.00	.18	.00	.00	.00	.00	.36	.00	.00	.00	.00	.16	.00	.00	.00	.00	.21	.00	.00
95B	.33	.29	.00	.00	.00	.00	.18	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.12	.00	.12	.15	.00	.00	.00	.00

Table E.35

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and Cluster Mean Component Weights, Top 5 Stepwise Reduction

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
12B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
13B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
16S	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
19K	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
27E	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
31C	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
51B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
54B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
55B	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
63B	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
67N	.34	.00	.00	.36	.00	.00	.21	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00	.00
71L	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
76Y	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
88M	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
91A	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
94B	.00	.00	.00	.48	.00	.00	.19	.00	.21	.00	.00	.00	.00	.38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00	.00
95B	.31	.33	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.40	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00

Table E.36

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and Cluster Mean Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.46	.33	.31
12B	.46	.33	.31
13B	.46	.33	.31
16S	.46	.33	.31
19K	.46	.33	.31
27E	.46	.33	.32
31C	.46	.33	.32
51B	.46	.33	.31
54B	.46	.33	.31
55B	.48	.33	.29
63B	.46	.33	.32
67N	.46	.33	.32
71L	.48	.33	.29
76Y	.48	.33	.29
88M	.48	.33	.29
91A	.48	.33	.29
94B	.48	.33	.29
95B	.46	.33	.31

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.37

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and Cluster Threshold Component Weights

MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
	Attribute																									
11B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
12B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
13B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
16S	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
19K	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
27E	.13	.12	.09	.11	.10	.10	.10	.10	.09	.08	.07	.08	.05	.11	.07	.08	.10	.07	.08	.07	.06	.07	.05	.05	.01	.07
31C	.13	.12	.09	.11	.10	.10	.10	.10	.09	.08	.07	.08	.05	.11	.07	.08	.10	.07	.08	.07	.06	.07	.05	.05	.01	.07
51B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
54B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06
55B	.13	.12	.09	.09	.10	.10	.11	.10	.09	.09	.07	.10	.05	.11	.07	.08	.09	.06	.08	.07	.08	.07	.05	.04	.01	.07
63B	.13	.12	.09	.11	.10	.10	.10	.10	.09	.08	.07	.08	.05	.11	.07	.08	.10	.07	.08	.07	.06	.07	.05	.05	.01	.07
67N	.13	.12	.09	.11	.10	.10	.10	.10	.09	.08	.07	.08	.05	.11	.07	.08	.10	.07	.08	.07	.06	.07	.05	.05	.01	.07
71L	.13	.12	.09	.09	.10	.10	.11	.10	.09	.09	.07	.10	.05	.11	.07	.08	.09	.06	.08	.07	.08	.07	.05	.04	.01	.07
76Y	.13	.12	.09	.09	.10	.10	.11	.10	.09	.09	.07	.10	.05	.11	.07	.08	.09	.06	.08	.07	.08	.07	.05	.04	.01	.07
88M	.13	.12	.09	.09	.10	.10	.11	.10	.09	.09	.07	.10	.05	.11	.07	.08	.09	.06	.08	.07	.08	.07	.05	.04	.01	.07
91A	.13	.12	.09	.09	.10	.10	.11	.10	.09	.09	.07	.10	.05	.11	.07	.08	.09	.06	.08	.07	.08	.07	.05	.04	.01	.07
94B	.13	.12	.09	.09	.10	.10	.11	.10	.09	.09	.07	.10	.05	.11	.07	.08	.09	.06	.08	.07	.08	.07	.05	.04	.01	.07
95B	.12	.12	.09	.11	.11	.10	.11	.09	.08	.08	.07	.08	.06	.10	.07	.08	.09	.07	.07	.08	.06	.07	.04	.05	.01	.06

Table E.38

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-1 Attribute Weights and Cluster Threshold Component Weights

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
12B	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
13B	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
16S	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
19K	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
27E	.21	.30	.00	.14	.00	.04	.13	.10	.13	.05	.13	.10	.00	.03	.03	.03	.03	.03	.10	.05	.00	.00	.00	.03	.00	.00
31C	.21	.30	.00	.14	.00	.04	.13	.10	.13	.05	.13	.10	.00	.03	.03	.03	.03	.03	.10	.05	.00	.00	.00	.03	.00	.00
51B	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
54B	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00
55B	.16	.34	.00	.12	.00	.00	.18	.12	.09	.09	.09	.21	.00	.00	.00	.00	.00	.00	.12	.09	.00	.00	.00	.00	.00	.00
63B	.21	.30	.00	.14	.00	.04	.13	.10	.13	.05	.13	.10	.00	.03	.03	.03	.03	.03	.10	.05	.00	.00	.00	.03	.00	.00
67N	.21	.30	.00	.14	.00	.04	.13	.10	.13	.05	.13	.10	.00	.03	.03	.03	.03	.03	.10	.05	.00	.00	.00	.03	.00	.00
71L	.16	.34	.00	.12	.00	.00	.18	.12	.09	.09	.09	.21	.00	.00	.00	.00	.00	.00	.12	.09	.00	.00	.00	.00	.00	.00
76Y	.16	.34	.00	.12	.00	.00	.18	.12	.09	.09	.09	.21	.00	.00	.00	.00	.00	.00	.12	.09	.00	.00	.00	.00	.00	.00
88M	.16	.34	.00	.12	.00	.00	.18	.12	.09	.09	.09	.21	.00	.00	.00	.00	.00	.00	.12	.09	.00	.00	.00	.00	.00	.00
91A	.16	.34	.00	.12	.00	.00	.18	.12	.09	.09	.09	.21	.00	.00	.00	.00	.00	.00	.12	.09	.00	.00	.00	.00	.00	.00
94B	.16	.34	.00	.12	.00	.00	.18	.12	.09	.09	.09	.21	.00	.00	.00	.00	.00	.00	.12	.09	.00	.00	.00	.00	.00	.00
95B	.19	.23	.02	.17	.12	.10	.17	.07	.09	.03	.09	.08	.05	.04	.02	.04	.02	.02	.07	.09	.00	.00	.00	.02	.00	.00

Table E.39

Normalized Attribute Weights for 18 MOS: Overall Performance, 0-Mean Attribute Weights and Cluster Threshold Component Weights

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
12B	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
13B	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
16S	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
19K	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
27E	.22	.27	.00	.14	.00	.03	.12	.13	.13	.05	.14	.09	.00	.03	.03	.03	.02	.03	.10	.04	.00	.00	.00	.03	.00	.00
31C	.22	.27	.00	.14	.00	.03	.12	.13	.13	.05	.14	.09	.00	.03	.03	.03	.02	.03	.10	.04	.00	.00	.00	.03	.00	.00
51B	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
54B	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00
55B	.20	.31	.00	.11	.00	.00	.18	.14	.09	.10	.10	.18	.00	.00	.00	.00	.00	.00	.10	.08	.00	.00	.00	.00	.00	.00
63B	.22	.27	.00	.14	.00	.03	.12	.13	.13	.05	.14	.09	.00	.03	.03	.03	.02	.03	.10	.04	.00	.00	.00	.03	.00	.00
67N	.22	.27	.00	.14	.00	.03	.12	.13	.13	.05	.14	.09	.00	.03	.03	.03	.02	.03	.10	.04	.00	.00	.00	.03	.00	.00
71L	.20	.31	.00	.11	.00	.00	.18	.14	.09	.10	.10	.18	.00	.00	.00	.00	.00	.00	.10	.08	.00	.00	.00	.00	.00	.00
76Y	.20	.31	.00	.11	.00	.00	.18	.14	.09	.10	.10	.18	.00	.00	.00	.00	.00	.00	.10	.08	.00	.00	.00	.00	.00	.00
88M	.20	.31	.00	.11	.00	.00	.18	.14	.09	.10	.10	.18	.00	.00	.00	.00	.00	.00	.10	.08	.00	.00	.00	.00	.00	.00
91A	.20	.31	.00	.11	.00	.00	.18	.14	.09	.10	.10	.18	.00	.00	.00	.00	.00	.00	.10	.08	.00	.00	.00	.00	.00	.00
94B	.20	.31	.00	.11	.00	.00	.18	.14	.09	.10	.10	.18	.00	.00	.00	.00	.00	.00	.10	.08	.00	.00	.00	.00	.00	.00
95B	.20	.22	.02	.17	.12	.09	.16	.09	.09	.04	.09	.07	.05	.04	.02	.03	.01	.02	.07	.09	.00	.00	.00	.02	.00	.00

Table E.40

Normalized Attribute Weights for 18 MOS: Overall Performance, Mean Attribute Validities and Cluster Threshold Component Weights, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.45	.33	.33
12B	.45	.33	.33
13B	.45	.33	.33
16S	.45	.33	.33
19K	.45	.33	.33
27E	.45	.31	.35
31C	.45	.31	.35
51B	.45	.33	.33
54B	.45	.33	.33
55B	.44	.31	.35
63B	.45	.31	.35
67N	.45	.31	.35
71L	.44	.31	.35
76Y	.44	.31	.35
88M	.44	.31	.35
91A	.44	.31	.35
94B	.44	.31	.35
95B	.45	.33	.33

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.41

Least Squares Beta Weights for 18 MOS: Core Technical Proficiency, No Reduction

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.23	.11	.08	.09	-.01	.13	.07	.14	.01	.02	-.01	.03	.02	.05	-.11	-.03	.11	.04	.02	.12	-.05	.06	-.06	.02	-.05	-.03
12B	.17	.14	.03	.03	.03	-.04	.03	.40	-.02	.00	.02	-.02	-.01	.12	.02	.09	-.04	-.18	-.03	.05	-.06	.01	.02	-.04	.03	-.00
13B	.10	.09	.10	.13	.03	.03	.03	-.0[illegible]	-.07	.04	.05	.04	-.02	-.01	.06	-.06	.06	.04	.13	.18	-.06	.03	-.03	-.02	-.02	-.10
16S	.22	.22	.24	.05	-.03	-.04	.01	-.17	.01	.05	-.01	.06	-.04	.02	-.03	.07	.10	-.10	-.06	.12	.02	.06	.02	-.02	-.12	-.03
19K	.07	.11	.12	.12	.05	.06	-.01	.24	.05	-.06	-.04	.08	-.07	.03	.03	-.08	.09	-.04	-.01	.14	.04	-.01	-.03	.05	.04	-.02
27E	.39	-.18	.34	.06	-.05	-.00	.01	-.00	.03	.12	-.06	.11	-.07	.19	.05	-.18	.00	-.00	.14	.20	-.18	-.31	-.02	.12	.11	-.10
31C	.25	.05	.39	-.04	-.02	-.02	.01	.17	.00	.06	-.09	-.01	-.00	.09	-.09	.01	.10	-.11	.12	-.09	.02	.11	.05	-.06	-.05	.03
51B	.26	.24	.19	.23	-.03	-.15	.14	.17	-.02	-.07	-.04	.19	.07	-.40	.19	-.16	.17	.27	.11	.21	-.14	-.15	-.31	.28	.28	-.12
54B	.32	.26	.16	-.06	.00	-.06	.05	.09	-.05	.13	-.13	.10	-.10	.21	.06	-.07	-.02	-.00	.03	.02	-.04	-.03	.04	-.12	-.05	.03
55B	.40	.15	-.08	-.07	.03	-.00	-.04	.21	-.10	.25	-.06	-.06	-.07	-.10	-.00	.20	.02	-.02	.12	.01	-.05	.01	.08	-.03	-.14	-.02
63B	.02	.14	-.02	-.01	.06	.05	.01	.42	-.02	.00	.02	.05	-.05	.07	.05	-.10	.11	-.02	.27	.06	-.08	-.11	.02	-.00	-.05	-.01
67N	.22	.04	-.04	.23	-.06	-.07	.02	.48	-.02	.02	.08	-.01	.01	-.10	-.07	.11	.11	.03	-.03	-.02	.03	-.05	.14	-.11	.02	-.04
71L	.14	.30	.24	.07	.01	-.03	.06	-.11	-.06	.02	-.00	.02	-.05	.08	.05	-.04	.09	-.09	-.12	-.02	.02	.01	.07	.03	-.03	.02
76Y	.07	.08	.38	-.01	.06	.06	-.06	.18	-.00	-.07	-.08	-.01	-.04	.14	-.01	.01	.03	-.09	.02	-.04	-.07	-.04	.04	.09	-.03	.02
88M	-.04	.25	.10	-.08	.02	.09	.05	.39	.01	-.05	-.02	-.01	-.05	-.05	.03	.03	.10	-.03	.05	.06	.01	-.02	-.02	.04	-.01	-.05
91A	.34	.17	.09	.03	.05	.08	-.07	.08	-.03	.01	.00	.03	-.09	.03	.02	-.11	.18	.05	.08	.13	.04	-.11	.04	-.05	.06	-.05
94B	.04	.23	.32	.02	.10	-.08	.15	.23	-.11	-.01	.04	-.05	-.05	.03	-.05	.09	.00	-.01	-.09	-.07	.03	-.11	.05	.03	.08	.04
95B	.21	.21	.17	.00	-.01	.01	.00	.12	-.05	.06	.00	.08	.01	-.04	.04	.04	.09	.00	-.02	-.03	.06	-.05	-.12	.09	-.01	-.02

Table E.42

Least Squares Beta Weights for 18 MOS: Core Technical Proficiency, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.26	.22	.28
12B	.17	.12	.44
13B	.06	.16	.21
16S	.23	.33	-.02
19K	.14	.23	.33
27E	.29	.33	.26
31C	.16	.35	.19
51B	.40	.29	.24
54B	.26	.26	.29
55B	.39	.05	.33
63B	-.07	.05	.70
67N	.12	.12	.63
71L	.29	.44	-.13
76Y	.16	.45	.10
88M	-.04	.22	.47
91A	.38	.24	.17
94B	.20	.51	.03
95B	.22	.32	.16

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Table E.43

Least Squares Beta Weights for 18 MOS: Overall Performance, No Reduction

	Attribute																								
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.07	.11	.11	.10	-.00	.13	.08	.10	-.05	.05	-.03	.02	.03	.06	.00	-.02	.17	-.01	.00	.14	-.01	.02	-.04	.09	-.03	-.07
12B	.11	.00	.16	.06	.01	-.01	.00	.25	-.01	.03	.02	.00	.02	.21	.07	.07	.15	-.20	-.15	.10	.03	.06	-.04	-.02	-.05	-.03
13B	-.05	.07	.16	.06	.06	.05	.02	.01	-.09	.11	.03	.04	-.03	.07	.06	-.03	.16	.05	.07	.11	.01	-.05	.04	-.01	.01	-.11
16S	.14	.22	.12	.15	-.03	-.03	.03	-.09	-.10	.06	.01	.05	.00	-.07	.06	.07	.23	-.03	-.13	.14	.04	.01	-.02	.07	-.04	-.08
19K	.02	.17	.15	.15	.04	-.04	.03	.18	.00	-.01	-.05	.10	.03	.05	.05	-.02	.23	-.12	-.07	.16	.00	-.05	-.03	.08	.08	-.10
27E	.39	-.21	.12	.25	-.06	-.05	.05	.07	.15	.00	.06	-.04	.01	.27	.04	-.21	.21	-.09	.04	.22	-.05	-.28	.00	.06	.15	-.07
31C	.07	.06	.32	.02	-.02	-.02	.08	.24	-.02	.12	-.14	.01	.07	.12	-.06	-.01	.23	-.10	.04	-.00	-.01	.07	-.03	-.03	-.02	-.05
51B	.00	.20	.39	.25	.12	-.06	.14	.15	.06	-.22	-.27	.17	.18	-.42	.16	-.08	.39	.18	.18	.47	-.13	-.17	-.44	.16	.53	-.24
54B	.20	.20	.16	.05	.00	-.06	.07	.11	-.08	.09	-.14	.13	-.02	.18	.06	-.02	.12	-.11	.00	.03	-.01	-.07	.07	.04	-.07	-.04
55B	.20	.08	.11	-.12	.05	.01	.01	.18	-.22	.29	-.01	.01	-.08	-.06	.05	.18	.06	.05	.18	.01	-.02	.10	-.14	.09	-.20	-.01
63B	.02	.12	-.00	-.04	.00	.04	.03	.32	-.09	.02	.06	.06	-.01	.17	.09	.01	.19	-.14	.10	.01	-.02	-.01	-.03	.10	-.05	-.09
67N	.27	.03	.04	.06	.00	-.02	.04	.39	-.00	.04	-.00	-.02	.05	-.07	-.03	.13	.22	-.01	.03	-.01	.05	-.06	.07	-.07	.02	-.10
71L	.07	.13	.18	.05	-.00	.09	.04	.08	-.04	.02	-.06	.04	.08	.17	.05	-.07	.18	-.06	-.05	.10	-.01	-.02	-.03	.04	-.03	-.08
76Y	.04	.05	.25	.03	.06	.11	-.04	.15	-.06	.01	-.06	.03	-.05	.19	.06	-.01	.09	-.08	.01	.04	-.03	.02	-.05	.07	-.01	-.00
88M	-.12	.05	.14	.04	.00	.07	.06	.37	.03	-.01	.00	.03	-.02	.02	-.00	.05	.20	.01	.07	.04	-.07	.02	-.10	.11	.02	-.05
91A	.14	.12	.05	.05	.02	.08	-.03	.22	-.05	.02	-.00	.08	-.08	.13	.02	-.02	.22	.01	-.04	.15	.05	-.07	.02	-.07	-.00	.08
94B	-.10	.13	.36	.07	.03	-.02	-.01	.09	-.06	-.05	.07	-.01	-.07	.06	.03	.07	.08	.10	-.09	-.00	.08	-.12	.05	.03	.08	.05
95B	.07	.23	.13	.01	-.02	.04	.01	.27	-.04	-.02	.03	.08	.05	-.03	.05	.04	.15	.05	-.07	.09	-.01	-.03	-.10	.08	-.04	.01

Table E.44

Least Squares Beta Weights for 18 MOS: Overall Job Performance, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.15	.25	.24
12B	.12	.27	.26
13B	-.09	.25	.21
16S	.26	.25	.06
19K	.10	.31	.27
27E	.35	.19	.31
31C	-.02	.36	.27
51B	.27	.24	.32
54B	.13	.35	.25
55B	.15	.15	.26
63B	-.02	.06	.47
67N	.22	.14	.51
71L	.13	.34	.14
76Y	.12	.32	.16
88M	-.14	.26	.43
91A	.13	.24	.27
94B	.03	.48	.01
95B	.09	.32	.33

[1]Verb = Project A measure A1AVERBL. [2]Numb = Project A measures A1AQUANT + B3CCNMSH. [3]Mech = Project A measure A1ATECH.

Appendix F

Validities of Synthetically Formed Prediction Equations for 18 MOS by Different Criterion Measures and by Different Weighting Methods

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Table F.1

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.45	.36	.44	.57	.47	.49	.79	.61	.49	.50	.74	.53	.44	.48	.60	.57	.50
12B	.68	.49	.38	.47	.61	.51	.52	.85	.65	.52	.53	.79	.56	.47	.52	.64	.61	.53
13B	.69	.50	.39	.48	.62	.52	.54	.87	.67	.54	.55	.81	.58	.48	.53	.66	.63	.54
16S	.65	.46	.36	.45	.58	.49	.51	.81	.63	.50	.51	.76	.55	.45	.50	.62	.59	.51
19K	.62	.45	.35	.43	.56	.47	.49	.77	.60	.48	.49	.72	.52	.43	.48	.59	.56	.48
27E	.70	.51	.40	.49	.63	.54	.56	.89	.69	.54	.56	.83	.60	[illegible]	.54	.67	.65	.55
31C	.67	.48	.38	.46	.60	.51	.53	.84	.65	.51	.52	.78	.57	.48	.51	.64	.62	.53
51B	.59	.42	.33	.41	.53	.44	.46	.74	.57	.45	.47	.69	.49	.41	.45	.56	.53	.46
54B	.62	.44	.35	.43	.56	.47	.49	.78	.60	.48	.48	.73	.53	.44	.47	.59	.57	.49
55B	.69	.49	.38	.48	.62	.52	.54	.86	.67	.53	.54	.81	.58	.48	.52	.65	.63	.54
63B	.67	.48	.38	.46	.60	.51	.52	.84	.65	.52	.53	.78	.56	.47	.52	.63	.61	.52
67N	.56	.41	.32	.39	.51	.43	.45	.71	.55	.43	.44	.66	.48	.40	.43	.54	.52	.45
71L	.58	.41	.32	.40	.52	.44	.46	.73	.57	.44	.45	.68	.50	.42	.44	.56	.54	.47
76Y	.68	.49	.38	.47	.61	.52	.54	.86	.66	.52	.53	.80	.58	.49	.52	.65	.63	.54
88M	.66	.47	.37	.45	.59	.49	.51	.82	.63	.50	.52	.77	.55	.46	.50	.62	.60	.52
91A	.65	.46	.36	.45	.58	.49	.51	.82	.63	.49	.50	.76	.56	.47	.49	.62	.60	.52
94B	.63	.45	.35	.44	.57	.48	.50	.80	.62	.48	.49	.74	.54	.45	.48	.60	.58	.50
95B	.65	.46	.36	.45	.58	.49	.51	.82	.63	.49	.50	.76	.56	.46	.49	.62	.60	.52

Table F.2

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.58	.43	.51	.65	.64	.57	.85	.71	.65	.60	.76	.58	.52	.58	.70	.67	.58
12B	.73	.60	.45	.52	.67	.67	.59	.89	.73	.68	.63	.80	.58	.54	.60	.72	.68	.60
13B	.72	.61	.45	.52	.67	.67	.59	.89	.73	.68	.63	.80	.58	.53	.61	.72	.68	.59
16S	.72	.59	.44	.51	.65	.65	.58	.87	.72	.66	.60	.77	.60	.54	.59	.71	.69	.60
19K	.68	.57	.42	.49	.63	.64	.56	.83	.69	.64	.60	.75	.55	.50	.58	.68	.64	.56
27E	.73	.61	.44	.53	.67	.67	.62	.92	.75	.68	.63	.80	.62	.56	.61	.73	.70	.60
31C	.71	.59	.43	.51	.65	.65	.60	.88	.72	.66	.60	.77	.60	.55	.59	.71	.69	.59
51B	.66	.56	.41	.47	.61	.62	.55	.83	.67	.63	.61	.75	.53	.49	.56	.67	.61	.54
54B	.69	.57	.42	.50	.63	.63	.57	.85	.70	.64	.58	.75	.58	.53	.57	.69	.67	.58
55B	.71	.58	.43	.52	.65	.65	.59	.89	.72	.65	.59	.78	.59	.53	.58	.71	.68	.59
63B	.71	.59	.44	.51	.65	.66	.59	.87	.72	.66	.61	.78	.58	.53	.60	.71	.67	.58
67N	.66	.55	.40	.48	.60	.61	.56	.83	.68	.61	.56	.73	.56	.51	.55	.66	.64	.55
71L	.67	.54	.39	.49	.61	.60	.55	.83	.68	.60	.53	.72	.58	.51	.54	.66	.65	.56
76Y	.72	.60	.43	.53	.66	.67	.62	.91	.74	.67	.60	.80	.63	.56	.60	.73	.71	.61
88M	.70	.58	.43	.51	.64	.65	.58	.86	.71	.65	.59	.76	.59	.53	.58	.70	.68	.59
91A	.70	.57	.42	.51	.64	.64	.59	.87	.72	.63	.57	.76	.61	.55	.57	.70	.69	.60
94B	.67	.56	.40	.50	.62	.63	.59	.88	.70	.62	.56	.76	.60	.54	.55	.68	.68	.58
95B	.72	.58	.43	.52	.65	.64	.57	.87	.72	.65	.58	.77	.61	.55	.58	.70	.69	.60

Table F.3

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.59	.43	.51	.65	.65	.58	86	.71	.66	.60	.77	.58	.53	.59	.70	.67	.59
12B	.73	.61	.45	.52	.67	.68	.59	.89	.73	.69	.63	.80	.58	.54	.61	.72	.68	.60
13B	.73	.61	.45	.52	.67	.68	.60	.89	.73	.69	.64	.81	.58	.53	.61	.73	.68	.60
16S	.72	.59	.44	.51	.66	.66	.59	.87	.72	.67	.60	.78	.59	.55	.59	.71	.69	.60
19K	.69	.58	.43	.49	.64	.65	.57	.83	.69	.65	.60	.75	.55	.51	.58	.69	.64	.56
27E	.73	.62	.44	.53	.67	.68	.62	.92	.75	.69	.63	.81	.61	.57	.61	.73	.70	.61
31C	.71	.60	.43	.51	.65	.66	.60	.88	.73	.66	.60	.78	.60	.56	.59	.71	.69	.60
51B	.66	.57	.41	.47	.61	.63	.56	.83	.68	.64	.61	.76	.52	.49	.57	.67	.61	.54
54B	.69	.58	.42	.50	.63	.64	.58	.85	.70	.65	.58	.76	.58	.54	.57	.69	.67	.58
55B	.71	.59	.43	.52	.65	.66	.59	.89	.72	.66	.60	.79	.59	.54	.58	.71	.68	.59
63B	.71	.60	.44	.51	.66	.67	.59	.87	.72	.67	.62	.78	.58	.53	.60	.71	.67	.59
67N	.66	.56	.40	.48	.61	.62	.57	.83	.68	.62	.57	.74	.56	.52	.55	.67	.64	.56
71L	.67	.55	.40	.49	.61	.61	.56	.83	.68	.61	.54	.73	.58	.52	.54	.67	.65	.56
76Y	.72	.60	.43	.53	.66	.68	.63	.91	.75	.68	.60	.80	.62	.57	.60	.74	.71	.61
88M	.70	.58	.43	.51	.65	.66	.58	.87	.71	.66	.59	.77	.58	.54	.58	.70	.68	.59
91A	.70	.58	.42	.51	.64	.65	.59	.87	.72	.64	.57	.76	.61	.56	.57	.70	.69	.60
94B	.67	.56	.40	.50	.62	.64	.59	.88	.70	.62	.56	.77	.60	.54	.56	.69	.68	.58
95B	.73	.59	.43	.52	.66	.65	.58	.88	.73	.66	.58	.78	.61	.55	.58	.71	.69	.61

Table F.4

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.49	.36	.44	.55	.53	.45	.81	.61	.57	.48	.67	.52	.44	.45	.57	.55	.45
12B	.68	.52	.38	.47	.59	.56	.48	.85	.65	.60	.51	.71	.55	.47	.48	.61	.58	.47
13B	.69	.53	.39	.47	.59	.60	.53	.91	.68	.65	.58	.75	.57	.51	.52	.64	.62	.49
16S	.65	.50	.37	.44	.58	.60	.51	.88	.64	.58	.57	.73	.55	.48	.48	.65	.61	.50
19K	.62	.48	.36	.42	.55	.58	.49	.84	.61	.56	.55	.69	.52	.45	.46	.62	.58	.48
27E	.68	.52	.39	.46	.60	.63	.53	.91	.66	.61	.59	.76	.57	.50	.50	.68	.63	.52
31C	.67	.51	.38	.45	.59	.61	.52	.89	.65	.59	.58	.74	.56	.49	.48	.66	.62	.52
51B	.57	.44	.33	.38	.50	.52	.44	.77	.55	.51	.50	.64	.48	.41	.42	.57	.52	.43
54B	.62	.47	.35	.42	.54	.57	.48	.83	.60	.55	.53	.68	.52	.45	.45	.61	.57	.48
55B	.63	.48	.36	.42	.56	.58	.49	.85	.62	.56	.55	.70	.54	.46	.46	.63	.59	.49
63B	.64	.49	.37	.43	.56	.59	.50	.85	.62	.57	.56	.71	.54	.46	.47	.63	.59	.49
67N	.58	.45	.33	.39	.51	.53	.46	.78	.57	.52	.51	.65	.49	.43	.42	.58	.54	.45
71L	.59	.45	.33	.41	.52	.51	.47	.80	.59	.54	.51	.64	.53	.44	.45	.59	.56	.46
76Y	.66	.52	.38	.46	.59	.58	.53	.91	.67	.61	.59	.73	.60	.50	.51	.67	.63	.52
88M	.66	.51	.38	.45	.59	.61	.52	.89	.65	.59	.58	.74	.56	.49	.48	.66	.62	.51
91A	.62	.48	.36	.44	.55	.53	.49	.85	.63	.59	.55	.70	.57	.45	.47	.63	.59	.49
94B	.63	.49	.36	.44	.56	.54	.50	.86	.64	.57	.55	.69	.57	.47	.48	.63	.60	.49
95B	.66	.50	.37	.44	.58	.60	.51	.87	.64	.57	.56	.72	.56	.48	.47	.65	.61	.51

Table F.5

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.50	.33	.44	.53	.51	.46	.80	.61	.56	.47	.69	.53	.49	.44	.58	.56	.45
12B	.67	.53	.35	.47	.56	.54	.49	.85	.64	.60	.50	.73	.56	.52	.46	.61	.59	.47
13B	.73	.57	.38	.50	.61	.59	.53	.92	.69	.65	.54	.79	.60	.56	.50	.66	.64	.51
16S	.66	.55	.41	.44	.59	.61	.54	.93	.70	.68	.63	.76	.57	.51	.51	.67	.64	.53
19K	.63	.52	.39	.41	.56	.59	.51	.89	.66	.65	.60	.72	.54	.48	.49	.64	.61	.50
27E	.69	.57	.43	.46	.62	.65	.57	.98	.73	.72	.66	.80	.60	.53	.54	.70	.67	.55
31C	.66	.55	.41	.44	.59	.62	.54	.93	.70	.68	.62	.76	.57	.51	.51	.67	.64	.53
51B	.59	.46	.31	.41	.50	.51	.43	.75	.55	.48	.45	.65	.50	.46	.39	.58	.54	.46
54B	.65	.48	.35	.44	.55	.55	.49	.82	.61	.52	.48	.69	.59	.51	.42	.63	.64	.53
55B	.63	.43	.34	.42	.53	.50	.42	.77	.56	.47	.46	.65	.54	.46	.40	.57	.58	.47
63B	.62	.52	.39	.41	.55	.58	.51	.88	.66	.64	.60	.72	.54	.48	.48	.63	.60	.50
67N	.60	.50	.37	.40	.53	.56	.49	.85	.64	.62	.57	.69	.52	.46	.47	.61	.58	.48
71L	.59	.47	.30	.43	.51	.47	.45	.77	.59	.51	.45	.64	.55	.48	.42	.60	.56	.48
76Y	.66	.56	.41	.46	.59	.58	.56	.95	.73	.70	.64	.75	.62	.52	.55	.69	.66	.54
88M	.65	.54	.40	.43	.57	.60	.53	.91	.68	.67	.61	.74	.56	.50	.50	.66	.63	.52
91A	.63	.50	.34	.47	.55	.49	.47	.83	.63	.57	.50	.72	.59	.50	.45	.65	.60	.52
94B	.64	.50	.33	.47	.55	.51	.48	.83	.63	.54	.49	.69	.60	.52	.45	.64	.60	.52
95B	.62	.43	.33	.42	.52	.50	.42	.76	.55	.46	.45	.65	.54	.46	.40	.57	.58	.47

Table F.6

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.55	.62	.55	.73	.67	.62
12B	.68	.65	.38	.48	.62	.79	.63	.33	.73	.70	.58	.77	.55	.63	.56	.73	.67	.62
13B	.68	.65	.38	.48	.62	.78	.63	.83	.72	.70	.58	.76	.54	.62	.56	.72	.67	.62
16S	.68	.65	.38	.49	.62	.79	.63	.83	.73	.70	.58	.76	.55	.63	.56	.73	.67	.62
19K	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.54	.62	.56	.73	.67	.62
27E	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.77	.54	.62	.56	.72	.67	.62
31C	.68	.64	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.55	.62	.55	.72	.67	.62
51B	.69	.66	.39	.49	.63	.79	.64	.84	.73	.71	.59	.78	.55	.63	.57	.73	.67	.63
54B	.68	.64	.38	.48	.62	.79	.63	.83	.73	.70	.58	.76	.55	.63	.55	.73	.67	.62
55B	.68	.65	.38	.49	.62	.79	.63	.83	.73	.70	.58	.76	.55	.63	.56	.73	.67	.63
63B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.54	.62	.56	.72	.67	.62
67N	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.76	.55	.62	.56	.73	.67	.62
71L	.68	.64	.38	.49	.61	.79	.63	.83	.72	.69	.57	.75	.55	.63	.55	.73	.67	.62
76Y	.68	.64	.38	.48	.62	.79	.63	.83	.73	.70	.57	.76	.55	.63	.55	.73	.67	.62
88M	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.55	.62	.55	.73	.67	.62
91A	.68	.64	.38	.49	.61	.79	.63	.83	.72	.69	.57	.75	.55	.63	.55	.73	.67	.62
94B	.68	.64	.38	.48	.61	.78	.63	.83	.72	.69	.57	.75	.55	.62	.55	.72	.67	.62
95B	.68	.64	.38	.49	.62	.79	.63	.83	.72	.70	.57	.76	.55	.63	.55	.73	.67	.62

Table F.7

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.46	.36	.44	.57	.48	.49	.78	.61	.49	.50	.73	.53	.43	.49	.60	.57	.49
12B	.68	.49	.39	.47	.62	.51	.53	.84	.65	.53	.55	.79	.55	.45	.53	.64	.61	.52
13B	.69	.51	.40	.47	.63	.52	.53	.86	.66	.55	.57	.81	.55	.45	.55	.65	.61	.53
16S	.66	.47	.38	.45	.59	.50	.51	.81	.63	.51	.52	.76	.54	.45	.51	.62	.60	.51
19K	.62	.45	.36	.43	.56	.47	.48	.76	.60	.49	.50	.72	.51	.42	.49	.59	.56	.48
27E	.70	.52	.41	.48	.64	.55	.57	.88	.69	.56	.59	.83	.58	.49	.57	.67	.64	.54
31C	.67	.49	.39	.47	.61	.53	.54	.83	.66	.53	.54	.78	.57	.48	.53	.64	.62	.52
51B	.59	.45	.34	.41	.54	.47	.47	.75	.58	.48	.50	.70	.48	.41	.47	.57	.53	.45
54B	.62	.45	.36	.43	.56	.48	.49	.77	.60	.49	.50	.72	.52	.43	.49	.59	.57	.49
55B	.68	.50	.39	.47	.61	.53	.54	.87	.67	.54	.56	.81	.56	.48	.54	.65	.62	.53
63B	.67	.49	.39	.46	.61	.52	.53	.84	.65	.53	.55	.79	.55	.46	.53	.64	.60	.52
67N	.57	.42	.32	.39	.51	.45	.47	.73	.56	.45	.46	.68	.49	.42	.45	.55	.53	.45
71L	.59	.41	.33	.41	.53	.46	.47	.72	.58	.45	.45	.68	.51	.43	.45	.57	.55	.47
76Y	.67	.48	.37	.48	.60	.54	.56	.86	.67	.51	.51	.79	.61	.52	.52	.65	.66	.55
88M	.65	.48	.38	.45	.59	.50	.52	.82	.63	.52	.53	.77	.54	.45	.51	.62	.59	.51
91A	.64	.44	.35	.45	.57	.47	.50	.79	.62	.47	.47	.75	.57	.47	.47	.61	.59	.52
94B	.62	.45	.35	.44	.56	.50	.52	.79	.62	.48	.47	.74	.57	.48	.48	.62	.61	.51
95B	.65	.45	.36	.44	.58	.47	.49	.81	.62	.48	.50	.75	.54	.45	.48	.61	.58	.51

Table F.8

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.70	.58	.45	.49	.65	.66	.56	.79	.69	.66	.60	.72	.56	.50	.60	.69	.66	.57
12B	.70	.59	.46	.49	.66	.66	.55	.79	.68	.67	.62	.75	.52	.49	.60	.70	.64	.56
13B	.68	.61	.45	.49	.65	.65	.54	.82	.67	.68	.66	.79	.47	.44	.61	.69	.58	.53
16S	.72	.60	.46	.50	.67	.67	.57	.81	.70	.69	.62	.75	.56	.52	.62	.71	.69	.59
19K	.67	.57	.43	.48	.62	.65	.54	.78	.66	.66	.60	.71	.51	.48	.58	.66	.63	.54
27E	.71	.61	.44	.51	.65	.66	.62	.90	.72	.68	.65	.79	.57	.53	.62	.71	.67	.56
31C	.70	.60	.43	.50	.64	.69	.60	.81	.71	.68	.60	.73	.56	.55	.60	.70	.67	.58
51B	.57	.56	.39	.41	.56	.63	.51	.78	.61	.66	.66	.72	.40	.42	.56	.61	.51	.45
54B	.69	.60	.43	.48	.64	.68	.57	.80	.69	.69	.61	.73	.54	.54	.59	.69	.68	.59
55B	.57	.54	.38	.47	.58	.67	.63	.90	.67	.65	.57	.79	.53	.47	.55	.67	.64	.52
63B	.66	.58	.45	.50	.63	.66	.58	.82	.68	.68	.64	.73	.51	.47	.61	.69	.63	.54
67N	.62	.56	.38	.46	.59	.59	.57	.86	.67	.62	.59	.75	.55	.51	.55	.67	.63	.54
71L	.63	.51	.39	.50	.59	.61	.56	.77	.66	.59	.50	.66	.57	.48	.55	.65	.64	.52
76Y	.61	.53	.37	.51	.60	.67	.67	.89	.71	.60	.50	.76	.65	.56	.55	.70	.72	.56
88M	.66	.58	.43	.50	.61	.66	.56	.82	.67	.70	.59	.71	.51	.49	.58	.68	.64	.56
91A	.64	.46	.38	.47	.56	.54	.50	.73	.64	.52	.45	.59	.60	.49	.49	.59	.64	.55
94B	.47	.42	.30	.44	.49	.57	.61	.79	.60	.46	.39	.67	.59	.51	.45	.58	.65	.48
95B	.71	.54	.42	.50	.64	.61	.53	.83	.69	.62	.56	.74	.57	.51	.55	.67	.65	.59

Table F.9

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.58	.45	.50	.66	.67	.56	.79	.69	.67	.61	.73	.55	.51	.60	.70	.67	.58
12B	.70	.60	.46	.50	.66	.67	.55	.79	.68	.68	.62	.76	.52	.49	.60	.70	.64	.56
13B	.68	.62	.45	.49	.66	.66	.54	.82	.68	.69	.66	.79	.46	.44	.61	.69	.59	.53
16S	.72	.60	.46	.50	.67	.68	.57	.81	.71	.70	.63	.76	.56	.53	.62	.72	.69	.59
19K	.67	.57	.43	.48	.63	.66	.54	.78	.66	.67	.61	.72	.51	.48	.58	.67	.63	.55
27E	.71	.62	.44	.51	.66	.66	.62	.90	.72	.68	.66	.80	.57	.53	.62	.71	.66	.56
31C	.70	.60	.43	.50	.64	.69	.60	.81	.71	.68	.60	.74	.56	.55	.60	.70	.67	.58
51B	.57	.57	.39	.40	.57	.64	.52	.79	.61	.66	.67	.72	.40	.42	.56	.62	.51	.46
54B	.70	.60	.44	.48	.64	.68	.57	.80	.70	.70	.61	.74	.54	.54	.59	.69	.68	.59
55B	.57	.54	.37	.46	.58	.68	.63	.89	.67	.65	.57	.79	.52	.47	.54	.67	.63	.51
63B	.67	.59	.45	.49	.63	.67	.58	.82	.69	.69	.64	.75	.51	.48	.61	.69	.63	.55
67N	.63	.58	.39	.46	.59	.61	.58	.86	.68	.64	.60	.76	.55	.52	.55	.67	.63	.55
71L	.64	.52	.39	.50	.59	.62	.57	.77	.66	.60	.50	.67	.57	.49	.55	.66	.64	.53
76Y	.62	.53	.37	.51	.60	.68	.67	.89	.71	.60	.50	.76	.65	.56	.55	.70	.72	.56
88M	.66	.59	.43	.50	.61	.68	.57	.83	/	.70	.60	.72	.51	.50	.58	.69	.64	.56
91A	.65	.47	.38	.48	.57	.56	.52	.75	.65	.54	.47	.61	.61	.50	.51	.61	.66	.56
94B	.45	.41	.28	.43	.48	.57	.61	.78	.58	.45	.38	.66	.58	.49	.44	.57	.64	.46
95B	.72	.56	.42	.50	.64	.62	.54	.84	.69	.63	.57	.75	.58	.51	.56	.68	.66	.59

Table F.10

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.55	.63	.56	.73	.67	.62
12B	.68	.65	.39	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.63	.56	.73	.67	.62
13B	.68	.65	.38	.47	.62	.78	.63	.82	.72	.70	.60	.78	.53	.62	.57	.72	.66	.62
16S	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.55	.63	.56	.73	.67	.62
19K	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.62	.56	.73	.67	.62
27E	.68	.66	.39	.47	.62	.78	.63	.82	.73	.70	.61	.78	.53	.61	.57	.72	.65	.62
31C	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.77	.54	.62	.56	.72	.67	.62
51B	.69	.66	.39	.48	.63	.79	.64	.83	.73	.71	.61	.79	.54	.63	.57	.73	.67	.63
54B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.55	.63	.56	.73	.67	.62
55B	.68	.65	.39	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.63	.56	.73	.67	.62
63B	.68	.65	.38	.47	.62	.78	.63	.83	.73	.70	.60	.78	.53	.62	.57	.72	.66	.62
67N	.68	.65	.38	.48	.62	.78	.63	.83	.73	.70	.59	.77	.54	.62	.56	.72	.66	.62
71L	.68	.64	.38	.49	.61	.79	.63	.83	.72	.69	.56	.75	.55	.63	.54	.73	.67	.62
76Y	.67	.63	.38	.49	.61	.79	.63	.83	.72	.69	.55	.74	.56	.63	.54	.73	.68	.62
88M	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.62	.56	.72	.66	.62
91A	.67	.63	.38	.49	.61	.78	.63	.83	.72	.69	.55	.74	.56	.63	.54	.73	.67	.62
94B	.67	.63	.38	.49	.61	.78	.63	.82	.72	.69	.56	.74	.56	.63	.54	.72	.67	.62
95B	.68	.64	.38	.48	.62	.79	.63	.83	.72	.70	.57	.76	.55	.62	.55	.73	.67	.62

Table F.11

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.45	.36	.44	.57	.48	.49	.79	.61	.49	.50	.74	.53	.44	.49	.60	.58	.50
12B	.68	.49	.38	.47	.61	.51	.53	.85	.65	.52	.53	.79	.57	.47	.52	.64	.62	.53
13B	.69	.50	.39	.48	.62	.52	.54	.87	.67	.53	.54	.81	.58	.48	.53	.66	.63	.55
16S	.65	.47	.36	.45	.58	.49	.51	.81	.63	.50	.51	.76	.55	.45	.50	.62	.59	.51
19K	.62	.44	.35	.43	.56	.46	.48	.77	.60	.47	.48	.72	.52	.43	.47	.59	.56	.49
27E	.70	.51	.39	.49	.63	.53	.56	.88	.68	.54	.55	.83	.60	.50	.54	.67	.65	.56
31C	.67	.48	.37	.46	.60	.51	.53	.84	.65	.51	.53	.78	.57	.48	.52	.64	.61	.53
51B	.59	.42	.33	.41	.53	.45	.46	.74	.57	.45	.47	.69	.50	.41	.45	.56	.54	.46
54B	.62	.44	.35	.43	.56	.47	.48	.77	.60	.48	.49	.72	.52	.43	.48	.59	.56	.49
55B	.69	.49	.38	.48	.62	.52	.54	.87	.67	.53	.53	.81	.59	.50	.52	.66	.64	.55
63B	.67	.48	.38	.46	.60	.50	.52	.84	.65	.51	.53	.78	.56	.47	.51	.63	.61	.52
67N	.56	.41	.32	.39	.51	.43	.44	.71	.55	.44	.45	.66	.48	.40	.43	.54	.51	.44
71L	.58	.42	.33	.41	.52	.44	.46	.74	.57	.44	.45	.69	.50	.42	.44	.56	.54	.47
76Y	.68	.48	.38	.47	.61	.51	.53	.85	.66	.52	.52	.79	.58	.49	.52	.65	.63	.54
88M	.66	.47	.37	.45	.59	.50	.51	.82	.64	.51	.52	.77	.55	.46	.51	.62	.60	.52
91A	.65	.46	.36	.45	.58	.49	.51	.82	.63	.49	.50	.76	.56	.46	.49	.62	.60	.52
94B	.63	.45	.35	.44	.57	.48	.50	.80	.62	.48	.49	.74	.55	.45	.48	.61	.59	.51
95B	.66	.47	.37	.45	.59	.49	.51	.82	.63	.50	.52	.77	.55	.46	.50	.62	.60	.52

Table F.12

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.59	.43	.51	.65	.65	.58	.87	.71	.66	.60	.77	.58	.53	.59	.70	.67	.59
12B	.73	.60	.45	.52	.67	.67	.59	.89	.73	.68	.62	.79	.60	.55	.60	.72	.69	.60
13B	.73	.60	.44	.52	.67	.66	.59	.88	.73	.67	.62	.79	.60	.54	.60	.72	.69	.60
16S	.71	.59	.44	.51	.65	.65	.58	.87	.72	.66	.60	.77	.59	.53	.59	.71	.68	.59
19K	.69	.56	.42	.49	.63	.63	.56	.83	.69	.63	.58	.74	.56	.51	.57	.68	.65	.57
27E	.73	.61	.44	.53	.67	.67	.62	.91	.75	.68	.62	.80	.62	.57	.61	.73	.71	.61
31C	.71	.59	.43	.51	.65	.65	.60	.88	.72	.66	.60	.78	.60	.55	.59	.71	.69	.59
51B	.67	.56	.41	.48	.61	.62	.56	.83	.68	.63	.58	.74	.55	.50	.56	.67	.64	.55
54B	.69	.56	.42	.49	.63	.63	.56	.84	.69	.63	.58	.74	.56	.51	.57	.68	.65	.57
55B	.71	.58	.43	.52	.65	.65	.60	.89	.73	.65	.58	.78	.62	.56	.58	.71	.70	.60
63B	.70	.59	.43	.51	.65	.66	.59	.88	.72	.66	.61	.78	.58	.53	.59	.71	.68	.59
67N	.66	.55	.41	.48	.61	.62	.56	.82	.67	.62	.58	.73	.55	.50	.56	.66	.63	.55
71L	.67	.54	.40	.49	.61	.61	.56	.83	.68	.61	.54	.73	.58	.52	.54	.67	.66	.56
76Y	.72	.59	.43	.53	.66	.66	.61	.90	.74	.66	.59	.79	.63	.56	.59	.72	.71	.61
88M	.70	.58	.43	.50	.64	.65	.58	.87	.71	.65	.61	.77	.58	.53	.59	.70	.67	.58
91A	.70	.57	.42	.51	.64	.64	.59	.88	.72	.64	.57	.77	.61	.55	.57	.70	.69	.59
94B	.69	.56	.41	.50	.63	.63	.58	.86	.70	.63	.56	.75	.60	.54	.56	.69	.67	.58
95B	.72	.60	.44	.52	.66	.66	.59	.88	.73	.67	.61	.79	.59	.54	.60	.72	.69	.60

Table F.13

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.59	.43	.51	.66	.66	.58	.87	.72	.67	.61	.78	.58	.54	.59	.71	.67	.59
12B	.73	.61	.45	.53	.67	.68	.60	.89	.74	.68	.62	.80	.60	.55	.61	.73	.69	.61
13B	.73	.61	.44	.52	.67	.67	.60	.89	.73	.68	.62	.80	.59	.55	.60	.72	.69	.60
16S	.72	.59	.44	.51	.66	.66	.58	.87	.72	.67	.61	.78	.58	.54	.59	.71	.68	.59
19K	.69	.57	.42	.49	.63	.64	.56	.84	.69	.64	.59	.75	.56	.52	.57	.68	.65	.57
27E	.73	.62	.44	.53	.67	.68	.62	.91	.75	.69	.63	.81	.62	.57	.61	.73	.71	.61
31C	.71	.60	.43	.51	.65	.66	.60	.89	.73	.66	.61	.79	.60	.55	.59	.71	.69	.59
51B	.67	.57	.41	.48	.62	.63	.56	.83	.68	.63	.59	.75	.55	.51	.56	.67	.64	.56
54B	.69	.57	.42	.50	.63	.64	.56	.84	.69	.64	.59	.75	.56	.52	.57	.68	.65	.57
55B	.72	.59	.43	.53	.65	.66	.61	.90	.73	.66	.59	.79	.62	.56	.58	.72	.70	.61
63B	.71	.60	.43	.51	.65	.67	.60	.88	.72	.67	.62	.79	.58	.54	.60	.71	.68	.59
67N	.66	.56	.41	.48	.61	.63	.56	.83	.68	.63	.58	.74	.55	.51	.56	.67	.63	.55
71L	.67	.55	.40	.49	.61	.62	.57	.84	.69	.62	.55	.74	.58	.53	.55	.67	.66	.57
76Y	.72	.60	.43	.53	.66	.67	.61	.90	.74	.67	.59	.79	.63	.57	.59	.73	.71	.61
88M	.70	.59	.43	.50	.64	.66	.59	.87	.71	.66	.61	.78	.57	.53	.59	.70	.67	.58
91A	.70	.58	.42	.52	.64	.65	.60	.88	.72	.65	.58	.77	.61	.55	.57	.71	.69	.60
94B	.69	.57	.41	.50	.63	.64	.58	.86	.70	.63	.56	.75	.60	.54	.56	.69	.67	.58
95B	.73	.61	.44	.52	.67	.67	.59	.89	.73	.68	.62	.79	.59	.55	.60	.72	.69	.60

Table F.14

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.45	.33	.46	.53	.47	.49	.75	.61	.52	.44	.63	.59	.47	.46	.56	.58	.46
12B	.69	.49	.36	.50	.58	.51	.54	.82	.67	.57	.49	.69	.65	.52	.51	.62	.64	.50
13B	.72	.51	.37	.52	.60	.53	.56	.85	.69	.59	.50	.71	.67	.53	.52	.64	.66	.52
16S	.66	.46	.34	.48	.55	.49	.51	.78	.63	.54	.46	.65	.61	.49	.48	.58	.60	.47
19K	.65	.46	.33	.47	.54	.48	.50	.77	.63	.53	.45	.64	.60	.48	.47	.57	.60	.47
27E	.68	.52	.39	.46	.60	.63	.53	.91	.66	.60	.59	.76	.58	.50	.49	.68	.63	.53
31C	.66	.51	.38	.45	.59	.61	.52	.89	.65	.59	.58	.74	.56	.49	.48	.66	.62	.51
51B	.57	.44	.33	.38	.51	.52	.45	.77	.56	.51	.50	.64	.48	.42	.42	.57	.53	.44
54B	.64	.45	.33	.46	.53	.47	.49	.75	.61	.52	.44	.63	.59	.47	.46	.56	.59	.46
55B	.63	.48	.36	.44	.56	.53	.49	.85	.64	.59	.55	.71	.57	.46	.48	.64	.60	.50
63B	.64	.49	.36	.43	.56	.58	.50	.86	.62	.57	.56	.71	.54	.46	.46	.63	.59	.49
67N	.58	.44	.33	.39	.51	.53	.45	.78	.57	.52	.51	.65	.49	.42	.42	.58	.54	.45
71L	.59	.45	.34	.42	.52	.50	.46	.80	.60	.56	.52	.66	.53	.43	.45	.60	.56	.47
76Y	.67	.52	.39	.48	.60	.57	.53	.91	.68	.63	.59	.76	.61	.49	.51	.68	.64	.53
88M	.66	.51	.38	.45	.59	.61	.52	.89	.65	.59	.58	.74	.56	.48	.48	.66	.61	.51
91A	.62	.48	.36	.44	.55	.53	.49	.85	.63	.59	.55	.70	.57	.45	.47	.63	.59	.49
94B	.64	.49	.37	.45	.57	.54	.51	.87	.65	.60	.57	.72	.58	.47	.49	.65	.61	.51
95B	.70	.49	.36	.51	.59	.52	.54	.83	.67	.57	.49	.69	.65	.52	.51	.62	.64	.50

Table F.15

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.50	.33	.46	.53	.48	.48	.81	.64	.58	.48	.67	.57	.50	.47	.59	.57	.46
12B	.66	.53	.34	.48	.56	.50	.50	.85	.67	.61	.50	.71	.60	.53	.49	.62	.60	.48
13B	.71	.56	.37	.52	.60	.54	.53	.91	.71	.65	.53	.75	.64	.56	.52	.66	.64	.51
16S	.64	.51	.33	.46	.54	.48	.48	.82	.64	.59	.48	.68	.58	.51	.47	.59	.58	.46
19K	.64	.51	.33	.47	.54	.49	.48	.83	.65	.59	.48	.69	.58	.51	.48	.60	.58	.47
27E	.69	.57	.43	.46	.61	.65	.56	.97	.73	.72	.66	.80	.60	.53	.54	.70	.67	.55
31C	.66	.55	.41	.44	.58	.61	.54	.93	.70	.68	.63	.76	.57	.51	.51	.67	.64	.53
51B	.57	.47	.35	.37	.50	.53	.46	.80	.60	.59	.54	.65	.49	.43	.44	.58	.55	.45
54B	.63	.50	.33	.46	.53	.48	.47	.81	.63	.58	.47	.67	.57	.50	.47	.59	.57	.46
55B	.64	.51	.34	.48	.56	.50	.48	.84	.64	.58	.51	.73	.60	.50	.45	.66	.61	.53
63B	.62	.52	.38	.41	.55	.58	.51	.88	.66	.64	.59	.72	.54	.48	.48	.63	.60	.50
67N	.60	.50	.37	.40	.53	.56	.49	.85	.63	.62	.57	.69	.52	.46	.47	.61	.58	.48
71L	.60	.47	.32	.44	.52	.47	.45	.78	.59	.54	.47	.68	.56	.47	.42	.61	.56	.49
76Y	.66	.52	.35	.49	.57	.52	.49	.86	.66	.59	.52	.75	.62	.52	.46	.67	.62	.54
88M	.65	.54	.40	.43	.57	.60	.53	.91	.68	.67	.62	.75	.56	.50	.50	.66	.63	.52
91A	.63	.50	.34	.47	.55	.50	.47	.83	.63	.57	.50	.72	.59	.50	.45	.65	.60	.52
94B	.65	.51	.35	.48	.56	.51	.49	.85	.65	.58	.51	.74	.61	.51	.46	.66	.61	.53
95B	.69	.55	.36	.50	.59	.53	.52	.89	.70	.64	.52	.74	.63	.55	.51	.65	.63	.50

Table F.16

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.55	.62	.56	.73	.67	.62
12B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.55	.63	.56	.73	.67	.62
13B	.68	.64	.38	.48	.62	.78	.63	.83	.72	.69	.58	.76	.55	.62	.55	.72	.67	.62
16S	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.55	.63	.56	.73	.67	.62
19K	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.76	.55	.63	.56	.73	.67	.62
27E	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.55	.62	.56	.72	.67	.62
31C	.68	.65	.38	.48	.62	.79	.63	.83	.72	.70	.58	.76	.54	.62	.56	.72	.67	.62
51B	.69	.65	.39	.49	.63	.79	.64	.84	.73	.70	.59	.77	.55	.63	.56	.73	.67	.63
54B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.76	.55	.63	.56	.73	.67	.62
55B	.68	.64	.38	.49	.62	.79	.63	.83	.73	.70	.57	.76	.55	.63	.55	.73	.67	.63
63B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.54	.62	.56	.73	.67	.62
67N	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.55	.62	.56	.73	.67	.62
71L	.68	.64	.38	.49	.62	.79	.63	.83	.72	.69	.57	.76	.55	.63	.55	.73	.67	.62
76Y	.68	.64	.38	.49	.62	.79	.63	.83	.72	.70	.57	.76	.55	.63	.55	.73	.67	.62
88M	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.54	.62	.56	.73	.67	.62
91A	.68	.64	.38	.48	.62	.79	.63	.83	.72	.69	.57	.76	.55	.63	.55	.73	.67	.62
94B	.68	.64	.38	.48	.61	.78	.63	.83	.72	.69	.57	.75	.55	.62	.55	.72	.67	.62
95B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.76	.55	.63	.56	.73	.67	.62

Table F.17

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.46	.37	.44	.58	.49	.50	.79	.62	.50	.51	.74	.53	.44	.50	.61	.58	.50
12B	.68	.49	.39	.47	.62	.52	.53	.84	.66	.53	.55	.79	.56	.47	.53	.65	.62	.53
13B	.69	.50	.40	.48	.63	.53	.54	.86	.67	.54	.55	.80	.57	.47	.54	.66	.63	.54
16S	.66	.47	.38	.45	.59	.50	.51	.81	.63	.51	.52	.76	.54	.45	.51	.62	.59	.51
19K	.62	.45	.36	.43	.56	.47	.49	.77	.60	.49	.50	.72	.51	.42	.49	.59	.56	.48
27E	.70	.53	.41	.49	.64	.56	.58	.88	.69	.57	.58	.83	.59	.50	.57	.67	.65	.54
31C	.66	.50	.38	.46	.61	.53	.55	.83	.65	.54	.55	.78	.56	.48	.54	.64	.61	.51
51B	.59	.44	.34	.41	.54	.47	.48	.74	.58	.48	.49	.70	.49	.42	.47	.57	.54	.46
54B	.62	.45	.36	.43	.56	.47	.49	.77	.60	.49	.50	.72	.51	.42	.49	.59	.56	.48
55B	.70	.52	.39	.49	.63	.57	.59	.88	.70	.56	.53	.81	.63	.55	.54	.68	.69	.57
63B	.67	.50	.39	.46	.61	.54	.55	.84	.66	.55	.55	.79	.55	.47	.54	.64	.62	.52
67N	.57	.43	.33	.40	.52	.46	.47	.72	.56	.47	.47	.68	.48	.40	.46	.55	.53	.45
71L	.61	.45	.33	.42	.54	.49	.51	.76	.60	.49	.46	.70	.54	.47	.47	.59	.59	.49
76Y	.69	.51	.38	.48	.62	.56	.58	.87	.68	.55	.52	.80	.62	.54	.53	.67	.68	.56
88M	.65	.48	.38	.45	.59	.52	.53	.82	.64	.53	.54	.77	.54	.46	.52	.63	.60	.51
91A	.68	.50	.37	.47	.61	.54	.57	.85	.67	.54	.51	.78	.61	.53	.52	.66	.66	.55
94B	.65	.48	.36	.45	.58	.52	.54	.81	.64	.52	.49	.74	.58	.50	.50	.63	.63	.52
95B	.66	.48	.38	.46	.60	.50	.52	.82	.64	.52	.53	.77	.55	.45	.52	.63	.60	.51

Table F.18

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.70	.58	.46	.50	.65	.67	.57	.81	.70	.68	.62	.73	.56	.51	.61	.70	.68	.58
12B	.71	.59	.46	.51	.66	.68	.58	.82	.71	.69	.63	.74	.56	.52	.62	.71	.69	.59
13B	.68	.56	.44	.48	.63	.64	.55	.78	.68	.66	.60	.71	.54	.49	.59	.68	.65	.56
16S	.70	.58	.46	.50	.66	.67	.58	.81	.70	.69	.62	.74	.56	.51	.61	.70	.68	.58
19K	.66	.55	.43	.47	.62	.63	.54	.76	.66	.65	.58	.69	.53	.48	.57	.66	.64	.55
27E	.71	.63	.44	.52	.66	.66	.63	.90	.73	.70	.64	.78	.59	.55	.62	.71	.68	.56
31C	.69	.61	.42	.50	.63	.64	.61	.87	.70	.67	.62	.75	.57	.53	.60	.69	.66	.54
51B	.62	.58	.41	.48	.59	.64	.55	.81	.65	.69	.59	.70	.48	.47	.56	.67	.61	.54
54B	.66	.55	.43	.48	.62	.63	.54	.76	.66	.65	.59	.69	.53	.48	.58	.66	.64	.55
55B	.65	.61	.39	.51	.59	.62	.58	.83	.70	.68	.54	.69	.60	.57	.54	.69	.67	.59
63B	.65	.60	.43	.50	.61	.67	.57	.84	.68	.72	.62	.73	.50	.49	.58	.69	.64	.56
67N	.66	.61	.43	.51	.62	.68	.58	.85	.69	.73	.62	.74	.51	.49	.59	.70	.64	.57
71L	.66	.62	.39	.52	.61	.64	.59	.85	.71	.70	.55	.71	.61	.58	.55	.71	.69	.60
76Y	.66	.62	.40	.52	.61	.64	.59	.85	.72	.70	.55	.71	.62	.59	.56	.71	.69	.61
88M	.64	.59	.42	.49	.60	.66	.56	.83	.66	.70	.60	.72	.49	.48	.57	.68	.62	.55
91A	.67	.63	.40	.53	.62	.65	.60	.86	.72	.71	.56	.72	.62	.59	.56	.72	.70	.61
94B	.65	.61	.39	.51	.60	.63	.58	.84	.70	.69	.54	.70	.60	.57	.55	.70	.68	.60
95B	.70	.58	.46	.50	.65	.66	.57	.80	.70	.68	.62	.73	.55	.51	.61	.70	.67	.58

Table F.19

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
	MOS Equation Was Applied To																	
11B	.70	.59	.46	.50	.66	.68	.58	.81	.70	.69	.62	.74	.55	.51	.61	.70	.68	.59
12B	.71	.60	.47	.51	.67	.69	.58	.82	.71	.70	.63	.75	.56	.52	.62	.71	.69	.59
13B	.68	.57	.44	.49	.64	.66	.56	.79	.68	.67	.60	.72	.54	.50	.59	.68	.66	.57
16S	.71	.59	.46	.51	.66	.68	.58	.82	.71	.70	.63	.75	.56	.52	.61	.71	.68	.59
19K	.66	.56	.43	.48	.62	.64	.54	.77	.67	.66	.59	.70	.52	.49	.58	.67	.64	.55
27E	.71	.64	.43	.51	.66	.67	.64	.90	.73	.70	.65	.79	.59	.55	.62	.71	.68	.56
31C	.69	.61	.42	.49	.63	.64	.61	.87	.70	.67	.62	.76	.56	.53	.60	.68	.65	.54
51B	.63	.59	.41	.48	.59	.67	.56	.81	.66	.70	.60	.72	.48	.47	.56	.67	.61	.54
54B	.67	.56	.44	.48	.62	.64	.55	.77	.67	.66	.59	.71	.53	.49	.58	.67	.64	.56
55B	.65	.61	.38	.50	.59	.66	.58	.83	.70	.69	.53	.70	.59	.58	.53	.70	.67	.60
63B	.65	.61	.43	.50	.62	.69	.58	.85	.68	.72	.62	.74	.49	.49	.58	.70	.63	.56
67N	.66	.62	.43	.51	.62	.70	.59	.86	.69	.73	.63	.75	.50	.50	.59	.71	.64	.57
71L	.67	.62	.39	.51	.61	.67	.60	.85	.72	.70	.54	.71	.60	.59	.54	.72	.68	.61
76Y	.67	.63	.39	.52	.61	.67	.60	.86	.72	.71	.55	.72	.61	.59	.55	.72	.69	.61
88M	.64	.59	.42	.49	.60	.68	.57	.83	.67	.71	.61	.73	.48	.48	.57	.68	.62	.55
91A	.68	.63	.39	.52	.62	.68	.61	.86	.73	.71	.55	.72	.61	.60	.55	.73	.69	.62
94B	.66	.61	.38	.51	.60	.66	.59	.84	.71	.69	.54	.70	.60	.58	.54	.71	.67	.60
95B	.70	.59	.46	.50	.65	.67	.57	.81	.70	.69	.62	.74	.55	.51	.61	.70	.67	.58

Table F.20

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.58	.77	.54	.62	.56	.72	.67	.62
12B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.55	.63	.56	.73	.67	.62
13B	.68	.65	.38	.48	.62	.78	.63	.82	.72	.70	.58	.77	.54	.62	.56	.72	.66	.62
16S	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.55	.63	.56	.73	.67	.62
19K	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.62	.56	.73	.67	.62
27E	.68	.66	.39	.47	.62	.78	.63	.82	.73	.70	.60	.78	.53	.62	.57	.72	.66	.62
31C	.68	.66	.39	.47	.62	.78	.63	.82	.72	.70	.60	.78	.53	.62	.57	.72	.66	.62
51B	.69	.66	.39	.48	.63	.79	.63	.83	.73	.71	.60	.78	.54	.62	.57	.73	.66	.62
54B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.62	.56	.73	.67	.62
55B	.68	.64	.38	.49	.61	.79	.63	.83	.72	.70	.56	.75	.56	.63	.54	.73	.67	.62
63B	.68	.65	.38	.47	.62	.78	.63	.83	.72	.70	.60	.78	.53	.62	.56	.72	.66	.62
67N	.68	.65	.38	.47	.62	.78	.63	.83	.73	.70	.60	.78	.53	.62	.56	.72	.66	.62
71L	.67	.63	.37	.49	.61	.78	.62	.83	.72	.69	.55	.74	.55	.62	.54	.73	.67	.62
76Y	.67	.63	.37	.49	.61	.78	.63	.83	.72	.69	.55	.74	.55	.62	.54	.73	.67	.62
88M	.68	.65	.38	.47	.62	.78	.63	.83	.72	.70	.60	.78	.53	.62	.56	.72	.66	.62
91A	.67	.63	.37	.49	.61	.78	.62	.83	.72	.69	.55	.74	.55	.62	.54	.73	.67	.62
94B	.67	.63	.37	.48	.61	.78	.62	.83	.72	.69	.55	.74	.55	.62	.54	.72	.67	.62
95B	.68	.65	.38	.48	.62	.79	.63	.83	.73	.70	.59	.77	.54	.62	.56	.73	.67	.62

Table F.21

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63D	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.50	.40	.53	.63	.54	.48	.71	.61	.43	.48	.80	.61	.47	.50	.57	.50	.58
12B	.69	.54	.43	.57	.68	.58	.51	.76	.65	.46	.52	.85	.65	.50	.53	.61	.54	.62
13B	.70	.55	.44	.58	.69	.59	.52	.78	.67	.47	.53	.87	.67	.51	.55	.63	.55	.64
16S	.66	.51	.41	.55	.65	.55	.49	.73	.63	.44	.49	.82	.63	.48	.51	.59	.52	.60
19K	.63	.49	.39	.52	.62	.53	.47	.70	.60	.42	.47	.78	.60	.46	.49	.56	.49	.57
27E	.71	.56	.44	.59	.70	.60	.53	.79	.68	.48	.54	.89	.68	.52	.56	.64	.56	.65
31C	.68	.53	.42	.56	.67	.57	.51	.75	.65	.45	.51	.84	.65	.50	.53	.61	.53	.62
51B	.60	.47	.37	.50	.59	.50	.44	.67	.57	.40	.45	.74	.57	.43	.47	.54	.46	.54
54B	.63	.49	.39	.52	.62	.53	.47	.70	.60	.42	.47	.78	.60	.46	.49	.56	.49	.57
55B	.70	.55	.43	.58	.69	.59	.52	.78	.67	.47	.52	.87	.67	.51	.54	.63	.55	.64
63B	.67	.53	.42	.56	.67	.57	.50	.75	.65	.46	.51	.84	.64	.49	.53	.61	.53	.61
67N	.57	.45	.35	.48	.56	.48	.43	.64	.55	.38	.43	.71	.55	.42	.45	.51	.45	.52
71L	.59	.46	.37	.50	.59	.50	.44	.66	.57	.39	.44	.74	.57	.44	.46	.53	.47	.54
76Y	.69	.54	.43	.58	.68	.58	.52	.77	.66	.46	.52	.86	.66	.51	.54	.62	.55	.63
88M	.66	.52	.41	.55	.66	.56	.49	.74	.64	.45	.50	.83	.63	.49	.52	.60	.52	.60
91A	.66	.51	.41	.55	.65	.55	.49	.73	.63	.44	.49	.82	.63	.49	.51	.59	.52	.60
94B	.64	.50	.40	.54	.63	.54	.48	.72	.62	.43	.48	.80	.62	.47	.50	.58	.51	.59
95B	.66	.52	.41	.56	.66	.56	.49	.74	.63	.44	.50	.82	.63	.49	.51	.59	.52	.61

Table F.22

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.66	.54	.41	.56	.67	.65	.52	.73	.66	.50	.49	.77	.61	.51	.53	.60	.50	.65
12B	.68	.56	.42	.57	.69	.68	.54	.77	.68	.52	.51	.80	.62	.52	.55	.62	.51	.67
13B	.67	.56	.42	.57	.69	.68	.54	.77	.68	.52	.51	.80	.62	.52	.55	.62	.51	.67
16S	.67	.55	.41	.57	.68	.66	.53	.75	.68	.51	.49	.78	.62	.52	.53	.60	.51	.66
19K	.63	.52	.39	.53	.64	.64	.51	.71	.64	.49	.47	.75	.58	.49	.52	.58	.48	.62
27E	.68	.56	.41	.58	.69	.67	.55	.78	.69	.52	.51	.80	.63	.53	.55	.62	.52	.67
31C	.66	.55	.41	.57	.67	.66	.54	.75	.68	.50	.49	.78	.62	.52	.53	.60	.51	.66
51B	.62	.52	.39	.52	.63	.63	.50	.72	.63	.49	.48	.75	.57	.48	.51	.57	.47	.61
54B	.64	.53	.39	.55	.65	.64	.52	.72	.65	.49	.47	.75	.59	.50	.51	.58	.49	.63
55B	.66	.55	.41	.57	.67	.66	.53	.76	.67	.50	.49	.79	.62	.51	.53	.60	.51	.66
63B	.65	.54	.40	.56	.67	.66	.53	.75	.67	.51	.49	.78	.61	.51	.54	.60	.50	.65
67N	.61	.51	.38	.53	.62	.61	.50	.71	.63	.47	.46	.73	.57	.48	.49	.56	.48	.61
71L	.62	.51	.38	.54	.63	.61	.50	.71	.63	.46	.45	.74	.59	.49	.49	.56	.49	.61
76Y	.66	.55	.41	.58	.68	.68	.55	.78	.69	.51	.50	.80	.63	.53	.54	.62	.53	.67
88M	.65	.53	.40	.56	.66	.65	.52	.73	.66	.50	.48	.77	.60	.51	.52	.59	.50	.65
91A	.65	.54	.40	.56	.66	.65	.53	.73	.67	.49	.48	.77	.61	.51	.52	.59	.51	.65
94B	.63	.52	.39	.55	.64	.64	.52	.74	.65	.48	.47	.77	.60	.50	.51	.59	.51	.63
95B	.68	.55	.41	.58	.68	.66	.53	.75	.68	.51	.49	.79	.63	.53	.53	.60	.52	.67

Table F.23

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.66	.55	.41	.56	.67	.66	.53	.74	.67	.51	.49	.78	.61	.51	.53	.60	.50	.65
12B	.67	.56	.42	.57	.68	.69	.54	.77	.68	.52	.51	.81	.62	.52	.55	.62	.51	.67
13B	.67	.57	.42	.57	.69	.69	.54	.77	.68	.52	.51	.81	.62	.52	.55	.62	.51	.67
16S	.66	.55	.41	.57	.67	.67	.53	.75	.67	.51	.49	.79	.61	.52	.53	.60	.51	.66
19K	.63	.53	.39	.53	.64	.65	.51	.72	.64	.49	.48	.75	.58	.49	.52	.58	.48	.62
27E	.68	.56	.41	.58	.69	.68	.55	.78	.69	.52	.51	.81	.63	.53	.55	.62	.52	.67
31C	.66	.55	.40	.57	.67	.66	.54	.76	.68	.51	.49	.79	.62	.53	.53	.60	.51	.66
51B	.62	.52	.38	.52	.63	.63	.50	.72	.63	.49	.48	.75	.57	.48	.51	.58	.47	.61
54B	.64	.53	.39	.55	.65	.65	.52	.73	.65	.49	.47	.76	.59	.50	.51	.58	.49	.64
55B	.66	.55	.40	.57	.67	.67	.53	.76	.67	.51	.49	.79	.61	.51	.53	.60	.51	.66
63B	.65	.54	.40	.55	.67	.67	.53	.75	.67	.51	.49	.78	.60	.51	.54	.60	.50	.65
67N	.61	.51	.37	.53	.62	.62	.50	.71	.63	.47	.46	.74	.57	.49	.49	.57	.48	.61
71L	.62	.52	.37	.54	.63	.62	.50	.71	.64	.47	.45	.74	.59	.49	.49	.57	.49	.62
76Y	.66	.56	.40	.58	.68	.69	.55	.78	.69	.51	.49	.81	.63	.53	.53	.62	.53	.67
88M	.65	.54	.40	.56	.66	.66	.52	.74	.66	.50	.48	.77	.60	.51	.52	.59	.50	.65
91A	.65	.54	.40	.56	.66	.66	.53	.74	.67	.50	.48	.78	.61	.52	.52	.60	.51	.65
94B	.63	.53	.38	.55	.64	.65	.52	.74	.65	.48	.47	.77	.60	.50	.50	.59	.51	.64
95B	.68	.56	.41	.58	.68	.67	.53	.76	.68	.51	.49	.80	.63	.53	.53	.61	.52	.67

Table F.24

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.53	.37	.51	.61	.61	.45	.74	.60	.46	.45	.72	.58	.47	.48	.53	.46	.53
12B	.67	.57	.39	.54	.64	.64	.47	.78	.63	.48	.48	.77	.62	.49	.50	.57	.49	.56
13B	.68	.57	.41	.54	.65	.68	.51	.82	.66	.52	.53	.80	.64	.52	.54	.59	.51	.57
16S	.65	.53	.40	.52	.63	.66	.49	.80	.63	.48	.52	.78	.62	.48	.50	.59	.51	.58
19K	.61	.51	.38	.49	.60	.64	.46	.76	.60	.46	.50	.75	.58	.46	.48	.56	.48	.55
27E	.67	.55	.41	.54	.65	.69	.50	.83	.66	.49	.54	.81	.64	.50	.52	.61	.53	.60
31C	.66	.54	.40	.53	.64	.68	.49	.81	.64	.48	.53	.80	.63	.49	.51	.60	.52	.59
51B	.61	.51	.36	.50	.58	.55	.43	.70	.57	.46	.45	.70	.56	.44	.45	.51	.44	.50
54B	.61	.50	.37	.49	.59	.63	.46	.75	.60	.45	.49	.74	.58	.46	.47	.56	.48	.54
55B	.63	.52	.38	.51	.61	.64	.47	.77	.61	.46	.50	.76	.60	.47	.49	.57	.49	.56
63B	.63	.52	.39	.50	.61	.65	.47	.78	.62	.47	.51	.76	.60	.47	.49	.57	.49	.56
67N	.57	.47	.35	.46	.56	.59	.43	.71	.56	.42	.46	.70	.55	.43	.45	.52	.45	.51
71L	.58	.47	.36	.48	.58	.57	.45	.72	.58	.44	.48	.71	.57	.44	.45	.54	.46	.53
76Y	.65	.53	.41	.54	.65	.64	.51	.81	.66	.50	.55	.80	.64	.50	.52	.61	.52	.60
88M	.66	.54	.40	.53	.64	.68	.49	.81	.64	.48	.53	.80	.63	.49	.51	.60	.52	.58
91A	.62	.51	.38	.50	.60	.64	.46	.76	.61	.45	.50	.75	.59	.47	.48	.56	.49	.55
94B	.63	.52	.38	.51	.61	.64	.47	.77	.61	.46	.50	.76	.60	.47	.48	.57	.49	.56
95B	.65	.54	.40	.53	.63	.67	.49	.79	.64	.47	.52	.79	.62	.49	.50	.59	.51	.58

Table F.25

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.61	.54	.35	.51	.58	.60	.44	.74	.59	.44	.45	.72	.58	.50	.46	.53	.48	.51
12B	.65	.58	.37	.54	.62	.63	.47	.78	.63	.47	.48	.76	.62	.53	.49	.57	.51	.55
13B	.70	.62	.40	.59	.67	.69	.51	.84	.68	.51	.51	.82	.66	.57	.53	.61	.55	.59
16S	.65	.57	.43	.52	.64	.67	.52	.85	.68	.55	.56	.81	.64	.51	.53	.62	.53	.60
19K	.62	.54	.40	.49	.61	.63	.50	.81	.64	.52	.53	.77	.60	.48	.50	.58	.50	.57
27E	.68	.60	.44	.55	.67	.70	.55	.89	.71	.58	.59	.85	.67	.54	.55	.65	.55	.63
31C	.65	.57	.42	.52	.64	.67	.52	.85	.68	.55	.56	.81	.64	.51	.52	.61	.52	.60
51B	.58	.51	.34	.50	.55	.53	.42	.69	.56	.44	.44	.69	.55	.46	.43	.51	.44	.48
54B	.60	.53	.39	.49	.59	.62	.49	.79	.63	.51	.52	.75	.59	.48	.49	.57	.49	.56
55B	.64	.51	.39	.52	.61	.60	.44	.69	.58	.40	.46	.70	.59	.47	.46	.54	.51	.55
63B	.61	.54	.40	.49	.60	.63	.49	.80	.64	.52	.53	.76	.60	.48	.50	.58	.49	.57
67N	.59	.52	.39	.48	.58	.61	.48	.77	.62	.50	.51	.74	.58	.47	.48	.56	.48	.55
71L	.58	.50	.34	.52	.58	.56	.43	.70	.58	.40	.45	.70	.57	.47	.42	.54	.48	.54
76Y	.65	.56	.43	.54	.66	.63	.54	.87	.70	.57	.59	.82	.66	.52	.54	.63	.53	.62
88M	.64	.56	.42	.51	.63	.66	.51	.83	.67	.54	.55	.79	.63	.50	.52	.60	.51	.59
91A	.63	.49	.38	.51	.59	.59	.43	.67	.57	.39	.45	.68	.58	.46	.45	.53	.50	.54
94B	.63	.50	.38	.52	.60	.59	.44	.68	.58	.40	.45	.69	.59	.47	.46	.53	.50	.54
95B	.63	.50	.39	.52	.60	.59	.44	.68	.58	.40	.45	.69	.59	.47	.46	.53	.51	.54

Table F.26

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
12B	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.47	.57	.47	.65
13B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
16S	.58	.57	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.46	.57	.47	.65
19K	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
27E	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
31C	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
51B	.58	.58	.33	.51	.60	.77	.54	.74	.65	.50	.44	.78	.55	.54	.47	.57	.48	.65
54B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
55B	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.46	.57	.47	.65
63B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.78	.55	.53	.47	.57	.47	.65
67N	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
71L	.57	.57	.32	.51	.59	.76	.53	.73	.64	.49	.42	.77	.55	.53	.46	.57	.47	.64
76Y	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
88M	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
91A	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
94B	.57	.57	.33	.50	.59	.75	.53	.73	.64	.49	.43	.77	.54	.53	.46	.56	.47	.64
95B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64

Table F.27

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.50	.40	.53	.63	.54	.47	.70	.61	.43	.48	.79	.61	.46	.50	.57	.50	.58
12B	.69	.54	.43	.57	.68	.57	.50	.75	.65	.46	.51	.85	.65	.49	.53	.61	.53	.62
13B	.70	.55	.44	.57	.69	.59	.52	.77	.66	.48	.53	.86	.66	.50	.55	.62	.53	.63
16S	.66	.51	.41	.55	.65	.55	.48	.72	.62	.44	.49	.81	.62	.48	.51	.59	.51	.60
19K	.63	.49	.39	.51	.62	.53	.46	.69	.60	.43	.47	.77	.59	.45	.49	.56	.48	.56
27E	.71	.55	.44	.59	.70	.60	.53	.79	.68	.48	.54	.88	.67	.52	.56	.63	.55	.64
31C	.68	.53	.42	.56	.67	.57	.50	.75	.65	.45	.51	.84	.65	.50	.53	.61	.53	.61
51B	.59	.47	.37	.49	.59	.50	.44	.67	.57	.41	.45	.74	.56	.43	.47	.54	.46	.53
54B	.63	.49	.39	.52	.62	.53	.47	.69	.60	.43	.47	.77	.59	.45	.50	.56	.48	.56
55B	.69	.54	.43	.57	.68	.59	.52	.77	.66	.47	.53	.86	.66	.50	.55	.62	.53	.62
63B	.67	.53	.42	.55	.67	.58	.51	.75	.65	.47	.51	.83	.64	.49	.54	.61	.52	.61
67N	.57	.45	.35	.47	.57	.49	.43	.65	.55	.39	.44	.71	.55	.42	.45	.52	.45	.52
71L	.59	.46	.37	.49	.58	.51	.45	.64	.57	.40	.43	.73	.57	.45	.46	.53	.47	.54
76Y	.68	.53	.43	.57	.68	.59	.52	.77	.67	.46	.51	.86	.66	.51	.54	.62	.55	.63
88M	.65	.51	.41	.54	.65	.56	.49	.73	.63	.45	.50	.81	.62	.47	.52	.59	.50	.59
91A	.65	.50	.41	.53	.64	.55	.48	.71	.62	.44	.49	.80	.61	.46	.51	.58	.50	.58
94B	.64	.50	.40	.53	.63	.53	.47	.70	.61	.42	.48	.80	.61	.47	.50	.57	.50	.57
95B	.67	.52	.41	.55	.65	.55	.49	.73	.63	.44	.49	.82	.63	.48	.51	.59	.52	.60

Table F.28

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.52	.41	.52	.66	.65	.51	.67	.64	.50	.46	.72	.58	.48	.53	.58	.47	.63
12B	.68	.56	.42	.57	.69	.66	.52	.73	.67	.51	.49	.78	.61	.51	.54	.61	.50	.66
13B	.65	.55	.41	.55	.67	.66	.51	.75	.65	.52	.50	.77	.58	.47	.55	.60	.47	.64
16S	.66	.54	.42	.55	.68	.66	.52	.71	.66	.52	.49	.76	.60	.51	.54	.60	.50	.66
19K	.60	.50	.39	.49	.62	.64	.49	.67	.61	.50	.46	.70	.54	.46	.51	.55	.44	.60
27E	.66	.55	.41	.57	.67	.65	.54	.76	.67	.52	.51	.76	.61	.51	.55	.61	.50	.64
31C	.67	.55	.41	.57	.68	.66	.54	.74	.68	.51	.50	.79	.62	.53	.54	.61	.51	.66
51B	.58	.49	.38	.49	.60	.61	.48	.70	.59	.48	.48	.70	.53	.43	.51	.55	.43	.57
54B	.60	.50	.39	.50	.62	.63	.50	.66	.61	.49	.45	.68	.55	.47	.51	.55	.46	.61
55B	.55	.47	.36	.49	.60	.63	.51	.72	.61	.48	.47	.72	.53	.43	.51	.57	.44	.57
63B	.59	.50	.39	.51	.62	.64	.51	.69	.62	.50	.47	.69	.54	.45	.53	.57	.44	.60
67N	.57	.50	.36	.52	.60	.59	.49	.74	.62	.47	.47	.74	.55	.46	.48	.57	.46	.59
71L	.56	.44	.35	.51	.59	.60	.48	.62	.60	.43	.39	.65	.54	.45	.46	.53	.45	.57
76Y	.55	.46	.35	.54	.62	.66	.55	.78	.66	.45	.44	.79	.59	.47	.50	.61	.53	.59
88M	.56	.47	.37	.49	.59	.62	.48	.65	.59	.48	.44	.65	.51	.42	.50	.55	.42	.57
91A	.60	.48	.39	.50	.62	.60	.49	.62	.61	.48	.45	.66	.54	.45	.51	.55	.44	.59
94B	.58	.48	.38	.54	.62	.59	.52	.73	.64	.45	.46	.75	.59	.47	.50	.59	.51	.59
95B	.67	.53	.41	.56	.67	.64	.51	.70	.65	.50	.48	.76	.61	.50	.52	.58	.50	.65

Table F.29

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.52	.40	.52	.66	.66	.51	.67	.64	.51	.46	.73	.57	.49	.53	.58	.47	.63
12B	.67	.56	.42	.57	.69	.67	.52	.73	.67	.52	.49	.78	.61	.51	.54	.61	.50	.66
13B	.65	.56	.41	.54	.67	.67	.51	.75	.65	.52	.50	.78	.57	.48	.55	.60	.47	.64
16S	.66	.55	.42	.55	.68	.67	.52	.72	.66	.52	.49	.76	.60	.51	.54	.60	.50	.66
19K	.60	.50	.39	.49	.62	.65	.49	.67	.61	.50	.46	.71	.54	.46	.51	.55	.44	.60
27E	.66	.55	.41	.57	.68	.66	.54	.77	.67	.52	.51	.77	.61	.51	.55	.61	.50	.65
31C	.67	.56	.41	.57	.68	.67	.54	.75	.68	.51	.50	.79	.62	.53	.54	.61	.51	.67
51B	.58	.50	.38	.49	.60	.62	.48	.70	.59	.49	.48	.71	.53	.43	.51	.55	.43	.58
54B	.61	.50	.39	.51	.62	.64	.50	.66	.62	.49	.45	.69	.54	.47	.51	.56	.46	.61
55B	.55	.47	.36	.49	.59	.65	.51	.73	.61	.49	.47	.73	.53	.43	.51	.57	.44	.57
63B	.59	.50	.39	.51	.62	.66	.51	.69	.63	.51	.48	.70	.54	.45	.53	.58	.44	.61
67N	.58	.51	.36	.52	.60	.61	.50	.75	.62	.48	.48	.75	.55	.47	.49	.57	.46	.60
71L	.57	.45	.35	.52	.59	.61	.49	.62	.60	.44	.39	.66	.55	.46	.46	.54	.45	.57
76Y	.56	.47	.35	.54	.62	.68	.55	.79	.66	.46	.44	.80	.59	.48	.50	.61	.53	.60
88M	.57	.48	.37	.49	.60	.64	.48	.66	.59	.49	.45	.66	.51	.43	.50	.55	.42	.58
91A	.60	.48	.39	.50	.62	.61	.49	.63	.61	.48	.45	.67	.54	.45	.51	.55	.44	.59
94B	.58	.48	.38	.54	.62	.60	.52	.73	.64	.45	.46	.76	.59	.47	.50	.59	.51	.60
95B	.67	.53	.41	.56	.67	.65	.51	.70	.66	.50	.48	.77	.61	.50	.52	.59	.50	.66

Table F.30

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
12B	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.47	.57	.47	.65
13B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.54	.53	.47	.57	.47	.65
16S	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.47	.57	.47	.65
19K	.58	.57	.33	.50	.60	.76	.53	.73	.65	.49	.44	.78	.55	.53	.47	.57	.47	.65
27E	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
31C	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
51B	.58	.58	.33	.51	.60	.77	.54	.74	.65	.50	.45	.79	.55	.54	.48	.58	.47	.66
54B	.58	.57	.33	.51	.60	.76	.53	.73	.65	.49	.44	.78	.55	.54	.47	.57	.47	.65
55B	.58	.58	.33	.50	.60	.76	.53	.74	.65	.49	.44	.78	.55	.54	.47	.57	.47	.65
63B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.54	.53	.47	.57	.46	.65
67N	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.54	.53	.47	.57	.47	.65
71L	.57	.57	.32	.51	.59	.76	.52	.73	.64	.49	.42	.76	.55	.53	.45	.56	.47	.64
76Y	.58	.57	.33	.51	.59	.76	.53	.73	.65	.49	.43	.77	.55	.54	.46	.57	.48	.65
88M	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
91A	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
94B	.57	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.54	.53	.46	.57	.47	.64
95B	.58	.57	.32	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64

Table F.31

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.50	.40	.53	.63	.54	.48	.71	.61	.43	.48	.80	.61	.47	.50	.57	.50	.58
12B	.69	.54	.43	.57	.68	.58	.51	.76	.66	.46	.52	.85	.65	.50	.53	.61	.54	.62
13B	.70	.55	.44	.58	.69	.59	.52	.78	.67	.47	.53	.87	.67	.51	.55	.63	.55	.64
16S	.66	.52	.41	.55	.65	.55	.49	.73	.63	.44	.49	.82	.63	.48	.51	.59	.51	.60
19K	.63	.49	.39	.52	.62	.53	.46	.69	.60	.42	.47	.78	.60	.46	.49	.56	.49	.57
27E	.71	.56	.44	.59	.70	.60	.53	.79	.68	.48	.54	.89	.68	.52	.56	.64	.56	.65
31C	.68	.53	.42	.56	.67	.57	.51	.75	.65	.45	.51	.84	.65	.50	.53	.61	.53	.62
51B	.60	.47	.37	.50	.59	.50	.44	.67	.57	.40	.45	.74	.57	.44	.47	.54	.47	.54
54B	.63	.49	.39	.52	.62	.53	.47	.70	.60	.42	.47	.78	.60	.46	.49	.56	.49	.57
55B	.70	.55	.43	.59	.69	.59	.52	.78	.67	.47	.52	.87	.67	.52	.54	.63	.55	.64
63B	.67	.53	.42	.56	.67	.57	.50	.75	.65	.45	.51	.84	.65	.50	.53	.61	.53	.61
67N	.57	.45	.35	.48	.56	.48	.43	.64	.55	.38	.43	.71	.55	.42	.45	.51	.45	.52
71L	.59	.46	.37	.50	.59	.50	.44	.66	.57	.40	.44	.74	.57	.44	.46	.53	.47	.54
76Y	.69	.54	.43	.58	.68	.58	.51	.77	.66	.46	.52	.86	.66	.51	.53	.62	.55	.63
88M	.67	.52	.41	.56	.66	.56	.50	.74	.64	.44	.50	.83	.64	.49	.52	.60	.53	.61
91A	.66	.51	.41	.55	.65	.55	.49	.73	.63	.44	.49	.82	.63	.48	.51	.59	.52	.60
94B	.64	.50	.40	.54	.64	.54	.48	.72	.62	.43	.48	.80	.62	.48	.50	.58	.51	.59
95B	.66	.52	.41	.55	.66	.56	.49	.74	.64	.45	.50	.83	.63	.49	.52	.60	.52	.60

Table F.32

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.66	.55	.41	.56	.67	.66	.53	.75	.67	.51	.49	.78	.61	.51	.53	.60	.50	.65
12B	.68	.56	.42	.58	.69	.68	.54	.77	.69	.52	.51	.80	.63	.52	.55	.62	.52	.67
13B	.67	.56	.42	.57	.69	.67	.54	.76	.68	.52	.50	.80	.62	.52	.55	.62	.51	.67
16S	.66	.55	.41	.56	.67	.66	.53	.75	.67	.51	.50	.78	.61	.51	.54	.60	.50	.65
19K	.64	.53	.39	.54	.65	.64	.51	.72	.65	.49	.48	.75	.59	.49	.51	.58	.48	.63
27E	.68	.56	.41	.58	.69	.67	.55	.77	.69	.52	.51	.80	.63	.53	.54	.62	.52	.67
31C	.66	.54	.40	.56	.67	.66	.54	.75	.68	.50	.50	.78	.62	.52	.53	.60	.51	.65
51B	.63	.52	.39	.53	.64	.63	.50	.71	.64	.48	.47	.74	.58	.49	.51	.57	.48	.62
54B	.64	.53	.39	.54	.65	.64	.51	.72	.64	.49	.48	.75	.59	.49	.51	.58	.48	.63
55B	.66	.55	.41	.57	.67	.66	.54	.76	.68	.50	.49	.79	.62	.52	.53	.61	.52	.66
63B	.66	.55	.40	.57	.67	.66	.54	.76	.68	.51	.50	.78	.62	.52	.53	.60	.51	.65
67N	.62	.51	.38	.53	.63	.61	.50	.71	.63	.47	.46	.73	.58	.49	.50	.56	.48	.61
71L	.62	.51	.38	.54	.63	.62	.50	.71	.64	.47	.46	.74	.58	.49	.50	.57	.49	.62
76Y	.67	.55	.41	.58	.68	.67	.55	.77	.69	.51	.50	.80	.63	.53	.54	.62	.53	.67
88M	.65	.54	.40	.57	.66	.65	.53	.74	.67	.50	.48	.78	.61	.51	.52	.60	.51	.65
91A	.65	.54	.40	.57	.66	.65	.53	.74	.67	.49	.48	.78	.61	.51	.52	.60	.51	.65
94B	.64	.53	.39	.55	.65	.64	.52	.73	.65	.48	.47	.76	.60	.50	.51	.58	.50	.64
95B	.67	.56	.42	.57	.68	.67	.54	.76	.68	.52	.50	.80	.62	.52	.54	.61	.51	.66

Table F.33

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.66	.55	.41	.56	.67	.67	.53	.75	.67	.51	.49	.79	.61	.51	.53	.60	.50	.65
12B	.68	.56	.42	.58	.69	.68	.54	.77	.69	.52	.51	.81	.62	.52	.55	.62	.51	.67
13B	.67	.56	.41	.57	.69	.68	.54	.77	.68	.52	.50	.80	.62	.52	.55	.62	.51	.67
16S	.66	.55	.41	.56	.67	.67	.53	.75	.67	.51	.49	.79	.61	.51	.53	.60	.50	.65
19K	.64	.53	.39	.54	.65	.64	.51	.72	.65	.49	.48	.76	.59	.49	.51	.58	.48	.63
27E	.67	.56	.41	.58	.69	.68	.55	.78	.69	.52	.51	.81	.63	.53	.54	.62	.52	.67
31C	.66	.55	.40	.56	.67	.66	.54	.76	.68	.51	.50	.79	.61	.52	.53	.60	.51	.65
51B	.63	.52	.39	.53	.64	.64	.50	.71	.64	.49	.47	.75	.58	.49	.51	.57	.48	.62
54B	.64	.53	.39	.54	.65	.64	.51	.72	.65	.49	.48	.76	.59	.49	.51	.58	.48	.63
55B	.66	.55	.40	.57	.67	.67	.54	.76	.68	.50	.49	.79	.62	.52	.52	.61	.52	.66
63B	.66	.55	.40	.57	.67	.66	.54	.76	.68	.51	.50	.79	.61	.52	.53	.61	.51	.66
67N	.62	.51	.38	.53	.63	.62	.50	.71	.63	.48	.46	.74	.57	.49	.50	.57	.48	.61
71L	.62	.52	.38	.54	.63	.63	.51	.72	.64	.48	.46	.75	.58	.49	.50	.57	.49	.62
76Y	.67	.56	.41	.58	.68	.68	.55	.77	.69	.51	.50	.80	.63	.53	.53	.62	.53	.67
88M	.65	.54	.40	.57	.66	.66	.53	.75	.67	.50	.48	.78	.61	.52	.52	.60	.51	.65
91A	.65	.54	.40	.57	.66	.66	.53	.75	.67	.50	.48	.78	.61	.52	.52	.60	.51	.65
94B	.64	.53	.39	.55	.65	.65	.52	.73	.65	.49	.47	.76	.60	.50	.51	.58	.50	.64
95B	.67	.56	.41	.57	.68	.68	.54	.77	.68	.52	.50	.80	.62	.52	.54	.62	.51	.67

Table F.34

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.62	.50	.37	.51	.60	.56	.47	.72	.61	.46	.49	.72	.61	.46	.48	.54	.47	.52
12B	.66	.53	.40	.54	.64	.60	.50	.76	.65	.50	.52	.77	.65	.49	.51	.58	.50	.56
13B	.67	.54	.40	.55	.65	.61	.51	.77	.66	.50	.53	.78	.66	.50	.52	.59	.51	.56
16S	.63	.51	.38	.52	.61	.58	.48	.73	.63	.47	.50	.74	.62	.47	.49	.55	.48	.53
19K	.63	.50	.38	.51	.61	.57	.48	.72	.62	.47	.49	.73	.61	.46	.49	.55	.48	.53
27E	.67	.55	.41	.54	.65	.69	.50	.83	.66	.49	.54	.81	.64	.50	.52	.61	.53	.60
31C	.66	.54	.40	.53	.64	.68	.49	.81	.64	.48	.53	.80	.63	.49	.51	.60	.52	.58
51B	.59	.47	.35	.48	.57	.53	.45	.68	.58	.44	.46	.69	.57	.44	.45	.51	.45	.49
54B	.60	.48	.36	.50	.58	.55	.46	.70	.60	.45	.47	.71	.59	.45	.47	.53	.46	.51
55B	.63	.52	.38	.51	.61	.65	.47	.77	.62	.46	.50	.76	.60	.47	.49	.57	.50	.56
63B	.63	.52	.39	.51	.62	.65	.47	.78	.62	.46	.51	.76	.60	.47	.49	.58	.50	.56
67N	.57	.47	.35	.46	.56	.59	.43	.71	.56	.42	.46	.70	.55	.43	.45	.52	.45	.51
71L	.59	.49	.36	.48	.57	.61	.44	.72	.58	.43	.47	.71	.56	.44	.45	.54	.47	.53
76Y	.66	.55	.40	.53	.64	.68	.50	.81	.65	.48	.53	.80	.63	.50	.51	.60	.52	.59
88M	.66	.54	.40	.53	.64	.68	.49	.81	.65	.48	.53	.80	.63	.50	.51	.60	.52	.59
91A	.62	.51	.38	.50	.60	.64	.46	.76	.61	.45	.50	.75	.59	.47	.48	.56	.49	.55
94B	.63	.52	.38	.51	.61	.64	.47	.77	.61	.46	.50	.76	.60	.47	.48	.57	.49	.56
95B	.67	.54	.40	.55	.65	.61	.51	.78	.66	.50	.53	.79	.66	.50	.52	.59	.51	.57

Table F.35

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.61	.53	.35	.53	.60	.56	.45	.74	.61	.45	.46	.72	.59	.50	.47	.54	.48	.53
12B	.64	.56	.37	.55	.62	.59	.48	.77	.64	.47	.49	.76	.62	.53	.49	.57	.51	.55
13B	.68	.60	.39	.59	.67	.63	.51	.83	.68	.51	.52	.81	.66	.56	.52	.61	.54	.59
16S	.62	.54	.35	.53	.60	.57	.46	.75	.61	.46	.47	.73	.60	.51	.47	.55	.49	.53
19K	.62	.54	.36	.54	.61	.57	.46	.75	.62	.46	.47	.73	.60	.51	.47	.55	.49	.54
27E	.68	.60	.44	.55	.67	.70	.55	.89	.71	.58	.59	.85	.67	.54	.55	.65	.55	.63
31C	.65	.57	.42	.52	.64	.67	.52	.85	.68	.55	.56	.80	.63	.51	.52	.61	.52	.60
51B	.58	.51	.34	.51	.57	.54	.44	.71	.58	.43	.44	.69	.57	.48	.45	.52	.46	.50
54B	.61	.53	.35	.53	.59	.56	.45	.73	.61	.45	.46	.72	.59	.50	.46	.54	.48	.53
55B	.64	.51	.39	.53	.61	.60	.44	.69	.59	.40	.46	.70	.60	.47	.46	.54	.51	.55
63B	.61	.54	.40	.49	.61	.63	.50	.80	.64	.52	.53	.76	.60	.48	.50	.58	.49	.57
67N	.59	.52	.39	.48	.58	.61	.48	.77	.62	.50	.51	.74	.58	.47	.48	.56	.48	.55
71L	.59	.47	.36	.49	.56	.56	.41	.64	.54	.37	.43	.65	.55	.44	.43	.50	.47	.51
76Y	.65	.51	.40	.53	.62	.61	.45	.70	.59	.41	.47	.71	.61	.48	.47	.55	.52	.56
88M	.67	.53	.41	.55	.64	.63	.47	.72	.62	.42	.48	.73	.63	.50	.49	.57	.54	.58
91A	.63	.49	.38	.51	.59	.59	.43	.67	.57	.39	.45	.68	.58	.46	.45	.53	.50	.54
94B	.63	.50	.38	.52	.60	.59	.44	.68	.58	.40	.45	.69	.59	.47	.46	.53	.50	.54
95B	.67	.59	.38	.58	.65	.62	.50	.81	.67	.50	.51	.79	.65	.55	51	.59	.53	.58

Table F.36

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
12B	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.47	.57	.47	.65
13B	.57	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
16S	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.43	.78	.55	.54	.47	.57	.47	.65
19K	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
27E	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
31C	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
51B	.58	.58	.33	.51	.60	.77	.54	.74	.65	.50	.44	.78	.55	.54	.47	.57	.48	.65
54B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
55B	.58	.57	.33	.51	.60	.76	.53	.73	.65	.49	.43	.77	.55	.54	.46	.57	.47	.65
63B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
67N	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65
71L	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
76Y	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
88M	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
91A	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.64
94B	.57	.57	.32	.50	.59	.75	.53	.73	.64	.49	.43	.77	.54	.53	.46	.56	.47	.64
95B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.46	.57	.47	.65

Table F.37

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.50	.40	.53	.63	.54	.47	.71	.61	.43	.48	.79	.61	.46	.50	.57	.50	.58
12B	.69	.54	.43	.57	.68	.58	.51	.75	.65	.46	.52	.85	.65	.49	.54	.61	.53	.62
13B	.70	.55	.44	.58	.69	.59	.52	.77	.66	.47	.53	.86	.66	.50	.55	.62	.54	.63
16S	.66	.52	.41	.54	.65	.55	.49	.73	.63	.45	.50	.81	.62	.47	.52	.59	.51	.59
19K	.62	.49	.39	.51	.62	.52	.46	.69	.59	.42	.47	.77	.59	.45	.49	.56	.48	.56
27E	.71	.55	.44	.59	.70	.60	.53	.79	.68	.48	.53	.88	.67	.51	.56	.63	.55	.64
31C	.67	.53	.42	.56	.67	.57	.50	.75	.64	.46	.51	.84	.64	.49	.53	.60	.52	.61
51B	.60	.47	.37	.49	.59	.50	.44	.66	.57	.41	.45	.74	.57	.43	.47	.53	.46	.54
54B	.63	.49	.39	.52	.62	.53	.46	.69	.60	.42	.47	.77	.59	.45	.49	.56	.48	.57
55B	.69	.54	.43	.57	.68	.58	.52	.76	.66	.47	.52	.86	.66	.50	.55	.62	.53	.62
63B	.67	.53	.42	.56	.67	.57	.50	.75	.64	.46	.51	.84	.64	.49	.53	.60	.52	.61
67N	.57	.45	.36	.47	.56	.48	.43	.63	.55	.39	.43	.71	.54	.41	.45	.51	.44	.51
71L	.58	.45	.37	.48	.58	.49	.44	.64	.56	.39	.44	.72	.56	.42	.46	.52	.45	.52
76Y	.68	.53	.43	.57	.68	.58	.51	.75	.66	.46	.52	.85	.65	.49	.54	.61	.53	.61
88M	.65	.51	.41	.54	.65	.55	.49	.72	.63	.44	.49	.81	.63	.47	.52	.59	.50	.59
91A	.65	.50	.40	.53	.64	.55	.48	.71	.62	.44	.49	.80	.62	.47	.51	.58	.50	.58
94B	.64	.50	.40	.53	.63	.54	.48	.70	.61	.43	.48	.79	.61	.46	.50	.57	.49	.57
95B	.67	.52	.42	.55	.66	.56	.49	.73	.63	.45	.50	.82	.63	.48	.52	.59	.51	.60

Table F.38

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.53	.42	.54	.66	.64	.51	.70	.65	.51	.48	.75	.59	.49	.54	.59	.48	.64
12B	.67	.54	.43	.55	.68	.66	.52	.72	.66	.52	.50	.76	.60	.50	.55	.60	.50	.66
13B	.65	.53	.42	.53	.66	.64	.51	.70	.64	.51	.48	.75	.59	.49	.54	.59	.48	.64
16S	.67	.54	.43	.55	.68	.66	.52	.71	.66	.52	.49	.76	.60	.50	.55	.60	.49	.65
19K	.62	.51	.40	.51	.63	.61	.49	.67	.62	.48	.46	.71	.56	.47	.51	.56	.46	.61
27E	.63	.52	.41	.55	.65	.64	.52	.73	.65	.51	.49	.74	.58	.48	.53	.60	.48	.63
31C	.63	.52	.40	.55	.65	.64	.51	.72	.64	.51	.49	.73	.57	.47	.53	.59	.47	.63
51B	.64	.52	.41	.52	.65	.63	.50	.68	.63	.50	.47	.73	.57	.48	.52	.57	.47	.62
54B	.63	.51	.40	.51	.64	.62	.49	.67	.62	.49	.47	.72	.57	.47	.52	.56	.47	.62
55B	.57	.47	.38	.50	.61	.58	.50	.63	.61	.48	.46	.66	.54	.43	.51	.56	.41	.57
63B	.63	.53	.41	.56	.65	.65	.52	.73	.65	.51	.50	.74	.58	.49	.54	.60	.48	.64
67N	.61	.51	.39	.53	.63	.62	.50	.70	.63	.49	.48	.71	.56	.46	.51	.58	.46	.61
71L	.57	.46	.38	.50	.61	.57	.49	.62	.60	.47	.45	.65	.53	.42	.50	.56	.41	.56
76Y	.60	.49	.40	.53	.64	.61	.52	.66	.64	.50	.48	.69	.56	.45	.54	.59	.43	.60
88M	.56	.46	.37	.49	.60	.57	.49	.62	.60	.47	.45	.65	.52	.42	.50	.55	.40	.56
91A	.56	.46	.37	.49	.60	.57	.49	.62	.60	.47	.45	.65	.52	.42	.50	.55	.40	.56
94B	.56	.46	.38	.50	.60	.57	.49	.62	.60	.47	.45	.65	.53	.42	.50	.55	.41	.56
95B	.66	.54	.42	.54	.67	.65	.52	.71	.65	.51	.49	.75	.59	.49	.54	.59	.49	.65

Table F.39

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.54	.42	.54	.67	.65	.51	.71	.65	.51	.49	.76	.59	.49	.54	.59	.49	.65
12B	.67	.55	.43	.55	.68	.67	.52	.72	.66	.53	.50	.77	.60	.50	.55	.60	.50	.66
13B	.65	.53	.42	.53	.66	.65	.51	.70	.65	.51	.48	.75	.59	.49	.54	.59	.48	.64
16S	.67	.55	.42	.55	.68	.67	.52	.72	.66	.52	.50	.77	.60	.50	.55	.60	.49	.66
19K	.62	.51	.40	.51	.63	.62	.49	.67	.62	.49	.46	.72	.56	.47	.51	.56	.46	.61
27E	.63	.53	.41	.55	.65	.66	.52	.74	.65	.51	.50	.75	.58	.48	.53	.60	.48	.64
31C	.63	.53	.40	.55	.65	.66	.52	.73	.65	.51	.49	.75	.58	.48	.53	.60	.48	.63
51B	.64	.52	.41	.52	.65	.64	.50	.69	.63	.50	.47	.74	.57	.48	.52	.57	.47	.63
54B	.63	.52	.40	.52	.64	.63	.49	.68	.62	.49	.47	.73	.56	.47	.52	.57	.47	.62
55B	.58	.48	.38	.51	.61	.60	.50	.64	.61	.49	.46	.68	.54	.43	.51	.56	.42	.58
63B	.64	.54	.41	.56	.66	.66	.52	.74	.66	.52	.50	.76	.58	.48	.54	.60	.48	.64
67N	.61	.51	.39	.53	.63	.64	.50	.71	.63	.50	.48	.72	.56	.46	.52	.58	.46	.61
71L	.58	.48	.38	.50	.61	.60	.50	.64	.61	.48	.45	.67	.53	.43	.51	.56	.41	.58
76Y	.61	.50	.40	.53	.64	.64	.52	.67	.65	.51	.48	.71	.56	.46	.54	.59	.44	.61
88M	.57	.47	.38	.50	.61	.60	.49	.63	.61	.48	.45	.67	.53	.43	.50	.56	.41	.57
91A	.57	.47	.38	.50	.60	.60	.49	.63	.60	.48	.45	.66	.53	.43	.50	.56	.41	.57
94B	.57	.47	.38	.50	.61	.60	.49	.63	.61	.48	.45	.67	.53	.43	.50	.56	.41	.57
95B	.66	.54	.42	.54	.67	.66	.52	.71	.65	.52	.49	.76	.59	.50	.54	.59	.49	.65

Table F.40

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.47	.57	.47	.65
12B	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.44	.78	.55	.54	.47	.57	.47	.65
13B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.43	.77	.55	.53	.47	.57	.47	.64
16S	.58	.58	.33	.51	.60	.76	.53	.73	.65	.49	.44	.78	.55	.54	.47	.57	.47	.65
19K	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.78	.55	.54	.47	.57	.47	.65
27E	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
31C	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.54	.53	.47	.57	.47	.65
51B	.58	.58	.33	.51	.60	.77	.54	.74	.65	.50	.44	.78	.55	.54	.47	.57	.48	.65
54B	.58	.57	.33	.51	.59	.76	.53	.73	.65	.49	.43	.78	.55	.54	.47	.57	.47	.65
55B	.58	.58	.33	.51	.60	.76	.53	.74	.65	.49	.44	.78	.55	.54	.47	.57	.47	.65
63B	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
67N	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
71L	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
76Y	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
88M	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
91A	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.55	.53	.47	.57	.47	.65
94B	.57	.57	.33	.50	.59	.76	.53	.73	.64	.49	.44	.78	.54	.53	.47	.57	.47	.64
95B	.58	.57	.33	.51	.59	.76	.53	.73	.64	.49	.43	.78	.55	.53	.47	.57	.47	.65

Table F.41

Validities of Least Squares Prediction Equations for 18 MOS: Core Technical Proficiency, No Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.75	.64	.43	.50	.67	.70	.57	.88	.71	.67	.62	.77	.54	.56	.60	.74	.65	.59
12B	.64	.70	.42	.44	.61	.72	.60	.82	.74	.76	.69	.78	.52	.59	.60	.67	.65	.57
13B	.69	.62	.49	.50	.67	.65	.50	.97	.70	.70	.69	.78	.47	.43	.60	.71	.59	.56
16S	.66	.57	.40	.59	.60	.60	.58	.88	.70	.60	.49	.64	.64	.56	.52	.63	.66	.58
19K	.69	.63	.43	.50	.68	.70	.59	.83	.72	.58	.63	.83	.57	.56	.61	.76	.65	.60
27E	.57	.59	.38	.45	.57	.86	.50	.82	.68	.67	.57	.72	.47	.54	.47	.79	.57	.58
31C	.62	.59	.36	.46	.56	.74	.69	.86	.72	.66	.59	.74	.59	.64	.56	.67	.66	.54
51B	.75	.67	.46	.56	.72	.82	.56	.93	.75	.56	.61	.91	.58	.59	.58	.92	.68	.75
54B	.63	.61	.39	.50	.59	.70	.58	.88	.78	.74	.60	.76	.62	.62	.56	.69	.66	.59
55B	.58	.61	.35	.41	.55	.58	.51	.85	.66	.76	.67	.73	.40	.48	.53	.55	.51	.51
63B	.50	.55	.40	.31	.54	.61	.48	.80	.62	.62	.75	.76	.33	.38	.58	.60	.47	.46
67N	.66	.65	.39	.45	.60	.67	.59	.84	.69	.72	.61	.84	.46	.54	.56	.69	.60	.59
71L	.58	.45	.33	.50	.51	.54	.54	.76	.63	.47	.35	.59	.68	.59	.43	.60	.70	.58
76Y	.59	.57	.34	.42	.56	.69	.60	.80	.68	.56	.54	.70	.60	.69	.50	.67	.70	.60
88M	.68	.64	.42	.45	.65	.65	.58	.84	.72	.62	.71	.80	.52	.55	.64	.68	.63	.61
91A	.64	.59	.40	.48	.63	.67	.57	.89	.72	.64	.60	.84	.55	.54	.56	.78	.64	.62
94B	.61	.53	.36	.46	.57	.63	.61	.71	.68	.60	.48	.70	.65	.65	.50	.68	.77	.66
95B	.70	.60	.39	.53	.61	.66	.59	.82	.72	.57	.56	.75	.62	.61	.54	.73	.68	.68

Table F.42

Validities of Least Squares Prediction Equations for 18 MOS: Core Technical Proficiency, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.68	.66	.39	.47	.62	.78	.63	.82	.73	.70	.60	.78	.53	.62	.57	.72	.66	.62
12B	.67	.67	.39	.44	.62	.76	.61	.80	.71	.70	.65	.81	.48	.58	.59	.70	.62	.59
13B	.67	.65	.39	.46	.62	.77	.62	.80	.71	.68	.62	.79	.51	.61	.58	.70	.65	.61
16S	.64	.57	.36	.51	.58	.76	.62	.80	.69	.63	.47	.66	.60	.64	.50	.71	.70	.62
19K	.68	.66	.39	.46	.63	.78	.63	.81	.72	.70	.63	.79	.52	.61	.58	.71	.65	.61
27E	.68	.64	.38	.49	.62	.79	.63	.83	.72	.69	.58	.76	.55	.63	.56	.72	.68	.62
31C	.67	.63	.38	.49	.61	.78	.64	.82	.72	.67	.57	.75	.56	.64	.56	.72	.69	.62
51B	.68	.65	.38	.49	.62	.79	.64	.84	.73	.70	.58	.76	.56	.63	.56	.73	.68	.63
54B	.68	.65	.39	.48	.62	.79	.63	.83	.73	.70	.60	.78	.54	.63	.57	.72	.67	.62
55B	.67	.66	.38	.45	.61	.77	.61	.82	.72	.71	.61	.79	.50	.59	.56	.71	.62	.60
63B	.60	.64	.36	.35	.57	.67	.53	.69	.64	.64	.68	.79	.36	.49	.58	.60	.51	.51
67N	.65	.67	.38	.41	.61	.74	.59	.77	.69	.69	.67	.81	.44	.56	.59	.67	.59	.57
71L	.61	.52	.33	.50	.54	.73	.60	.76	.65	.58	.40	.59	.60	.63	.45	.68	.68	.59
76Y	.65	.60	.37	.50	.60	.77	.63	.80	.70	.64	.52	.70	.58	.65	.53	.71	.70	.62
88M	.65	.65	.39	.42	.61	.74	.59	.76	.69	.66	.66	.80	.45	.57	.59	.66	.60	.58
91A	.68	.64	.38	.49	.61	.79	.63	.83	.72	.69	.56	.75	.56	.63	.54	.73	.67	.62
94B	.64	.57	.36	.50	.58	.76	.62	.79	.69	.62	.48	.67	.59	.64	.51	.70	.70	.61
95B	.67	.63	.38	.49	.61	.79	.64	.82	.72	.68	.56	.74	.57	.64	.55	.72	.69	.63

Table F.43

Validities of Least Squares Prediction Equations for 18 MOS: Overall Performance, No Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.70	.60	.41	.57	.68	.63	.51	.80	.66	.44	.51	.80	.62	.51	.52	.60	.48	.66
12B	.67	.68	.42	.58	.65	.71	.54	.79	.69	.47	.53	.82	.64	.58	.50	.58	.50	.67
13B	.70	.60	.50	.60	.71	.57	.52	.85	.70	.51	.57	.89	.65	.52	.55	.67	.54	.70
16S	.67	.59	.39	.65	.66	.52	.49	.75	.65	.36	.44	.73	.61	.50	.42	.55	.50	.67
19K	.68	.63	.44	.62	.71	.67	.56	.80	.71	.40	.52	.87	.65	.57	.52	.66	.51	.71
27E	.56	.58	.38	.52	.59	.85	.46	.84	.62	.44	.44	.83	.53	.46	.43	.63	.44	.62
31C	.70	.68	.44	.57	.71	.79	.63	.89	.77	.51	.56	.92	.70	.63	.57	.65	.51	.70
51B	.73	.68	.44	.67	.79	.73	.53	.91	.72	.37	.52	1.03	.65	.60	.58	.78	.49	.83
54B	.62	.59	.41	.56	.65	.64	.57	.77	.73	.47	.52	.81	.65	.57	.48	.61	.50	.65
55B	.63	.57	.39	.51	.61	.52	.50	.85	.64	.62	.65	.82	.56	.49	.53	.53	.43	.65
63B	.60	.56	.43	.49	.60	.57	.51	.80	.64	.44	.62	.80	.58	.49	.51	.58	.44	.63
67N	.60	.58	.37	.50	.60	.69	.52	.76	.63	.47	.50	.84	.55	.50	.48	.57	.42	.65
71L	.69	.64	.42	.58	.67	.64	.51	.78	.68	.43	.50	.80	.65	.56	.49	.60	.49	.67
76Y	.64	.62	.41	.55	.65	.65	.55	.82	.70	.46	.54	.84	.65	.61	.51	.62	.57	.67
88M	.69	.63	.45	.56	.70	.70	.57	.88	.70	.47	.61	.91	.63	.58	.60	.66	.51	.74
91A	.65	.61	.43	.60	.68	.65	.56	.88	.72	.47	.55	.94	.65	.54	.53	.68	.55	.70
94B	.57	.51	.39	.59	.60	.53	.52	.69	.63	.37	.41	.78	.60	.53	.42	.59	.63	.67
95B	.68	.63	.41	.62	.68	.63	.54	.79	.69	.45	.52	.83	.63	.55	.52	.62	.51	.73

Table F.44

Validities of Least Squares Prediction Equations for 18 MOS: Overall Performance, ASVAB Reduction

MOS Equation Was Developed On	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
	MOS Equation Was Applied To																	
11B	.58	.58	.34	.50	.60	.75	.54	.73	.65	.49	.44	.78	.55	.54	.49	.57	.48	.65
12B	.58	.58	.35	.50	.60	.76	.55	.73	.65	.50	.45	.78	.55	.54	.49	.58	.48	.66
13B	.55	.55	.36	.46	.58	.69	.54	.67	.62	.46	.44	.73	.53	.51	.50	.55	.47	.63
16S	.57	.57	.32	.51	.59	.74	.53	.72	.64	.48	.40	.74	.55	.54	.44	.56	.49	.64
19K	.58	.58	.35	.50	.60	.75	.55	.72	.65	.49	.45	.78	.55	.54	.49	.57	.49	.66
27E	.58	.57	.33	.50	.59	.76	.53	.73	.64	.49	.45	.78	.54	.53	.47	.57	.46	.65
31C	.57	.57	.36	.49	.60	.73	.55	.71	.64	.48	.44	.76	.55	.54	.50	.57	.49	.65
51B	.58	.58	.34	.50	.60	.77	.54	.74	.65	.50	.45	.79	.55	.54	.48	.58	.47	.66
54B	.58	.58	.35	.50	.60	.75	.55	.72	.65	.49	.44	.77	.56	.54	.49	.57	.49	.66
55B	.58	.58	.34	.49	.60	.76	.54	.73	.64	.50	.46	.79	.54	.53	.49	.57	.46	.65
63B	.53	.53	.33	.41	.55	.69	.50	.67	.58	.47	.49	.77	.47	.47	.50	.53	.38	.60
67N	.57	.56	.33	.47	.58	.75	.52	.72	.63	.49	.47	.80	.52	.51	.49	.57	.43	.64
71L	.57	.57	.34	.51	.60	.74	.54	.71	.65	.48	.41	.75	.56	.54	.47	.56	.50	.65
76Y	.58	.57	.34	.51	.60	.74	.54	.72	.65	.48	.42	.75	.56	.54	.48	.57	.50	.65
88M	.54	.54	.35	.43	.57	.69	.53	.67	.60	.47	.47	.76	.51	.50	.52	.55	.43	.62
91A	.58	.58	.34	.49	.60	.75	.54	.73	.65	.49	.45	.78	.55	.53	.49	.57	.47	.65
94B	.53	.53	.33	.48	.56	.67	.52	.64	.61	.43	.34	.65	.54	.52	.43	.52	.51	.60
95B	.58	.58	.35	.49	.60	.75	.55	.73	.65	.49	.45	.78	.55	.54	.50	.58	.48	.66

Appendix G

Task Complexity Questionnaire Item Means and Standard Deviations for Different Tasks

Table G.1

Task Complexity Questionnaire Item Means and Standard Deviations for an Electrical and Electronic Systems Maintenance Task

	MOS			
	27E		29E	
Task Complexity Items	Mean	S.D.	Mean	S.D.
1. Are job or memory aids used?	1.28	0.46	1.17	0.38
2. Quality of job aids.	3.84	0.90	3.76	0.88
3. How many steps are task divided?	2.72	0.68	2.86	0.65
4. Steps performed in definite sequence?	3.24	0.44	3.07	0.38
5. Built-in feedback?	2.84	0.80	3.04	0.96
6. Time limit for completion?	1.20	0.41	1.50	0.58
7. Mental processing requirements?	1.84	0.62	2.04	0.58
8. Number of facts, terms, etc. memorize?	2.08	0.86	2.46	1.04
9. How hard are the facts or terms?	2.08	0.28	2.25	0.52
10. What are the motor control demands?	1.92	0.64	2.32	0.61

Table G.2

Task Complexity Questionnaire Item Means and Standard Deviations for a Vehicle and Equipment Operations Task

Task Complexity Items	MOS							
	12B		13B		51B		54B	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Are job or memory aids used?	1.30	0.46	1.47	0.50	1.23	0.42	1.36	0.48
2. Quality of job aids.	3.77	0.80	3.52	0.96	3.65	0.83	3.67	0.82
3. How many steps are task divided?	3.14	0.89	2.94	0.85	3.18	0.88	2.85	0.86
4. Steps performed in definite sequence?	3.23	0.45	3.21	0.58	3.29	0.58	3.13	0.54
5. Built-in feedback?	2.46	0.84	2.46	0.95	2.51	0.82	2.48	0.76
6. Time limit for completion?	1.30	0.49	1.49	0.58	1.22	0.47	1.26	0.47
7. Mental processing requirements?	2.13	0.63	2.03	0.71	2.06	0.63	2.10	0.69
8. Number of facts, terms, etc. memorize?	2.62	0.90	2.38	0.98	2.74	0.99	2.65	0.89
9. How hard are the facts or terms?	2.13	0.43	2.17	0.63	2.17	0.63	2.14	0.39
10. What are the motor control demands?	2.84	0.46	2.72	0.65	2.85	0.43	2.84	0.50

Table G.3

Task Complexity Questionnaire Item Means and Standard Deviations for a Clerical Task

	MOS			
	55B		95B	
Task Complexity Items	Mean	S.D.	Mean	S.D.
1. Are job or memory aids used?	1.28	0.46	1.18	0.39
2. Quality of job aids.	4.03	0.70	3.53	0.76
3. How many steps are task divided?	2.50	0.77	2.36	0.80
4. Steps performed in definite sequence?	3.12	0.83	3.24	0.68
5. Built-in feedback?	2.71	1.22	2.82	1.17
6. Time limit for completion?	1.22	0.47	1.67	0.60
7. Mental processing requirements?	2.12	0.63	2.33	0.56
8. Number of facts, terms, etc. memorize?	2.31	0.89	2.58	1.01
9. How hard are the facts or terms?	2.06	0.63	2.31	0.76
10. What are the motor control demands?	1.78	0.85	2.36	0.86

Table G.4

Task Complexity Questionnaire Item Means and Standard Deviations for a Communication Task

	MOS					
	31C		31D		96B	
Task Complexity Items	Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Are job or memory aids used?	1.26	0.44	1.06	0.24	1.15	0.36
2. Quality of job aids.	3.91	0.80	3.81	0.66	3.78	0.82
3. How many steps are task divided?	2.37	0.63	2.24	0.44	2.39	0.49
4. Steps performed in definite sequence?	3.70	0.49	3.47	0.51	3.55	0.56
5. Built-in feedback?	2.51	1.20	2.53	1.12	2.55	1.04
6. Time limit for completion?	1.77	0.51	1.82	0.39	1.63	0.52
7. Mental processing requirements?	1.88	0.61	1.76	0.56	1.98	0.59
8. Number of facts, terms, etc. memorize?	2.38	0.86	2.53	1.07	2.89	0.77
9. How hard are the facts or terms?	2.08	0.42	2.12	0.33	2.32	0.50
10. What are the motor control demands?	2.00	0.69	1.88	0.60	2.08	0.52

Table G.5

Task Complexity Questionnaire Item Means and Standard Deviations for an Individual Combat Task

Task Complexity Items	MOS																					
	12B		13B		27E		29E		31C		31D		51B		54B		55B		95B		96B	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Are job or memory aids used?	1.42	0.50	1.42	0.50	1.60	0.50	1.27	0.45	1.42	0.50	1.41	0.51	1.36	0.48	1.53	0.50	1.27	0.45	1.49	0.50	1.63	0.49
2. Quality of job aids.	3.63	0.99	3.44	1.06	3.36	1.36	3.46	1.10	3.83	0.93	4.00	1.18	3.53	1.18	3.62	0.95	3.83	0.88	3.60	1.01	3.44	0.96
3. How many steps are task divided?	3.03	0.64	2.77	0.66	2.92	0.64	2.80	0.76	2.75	0.72	2.71	0.69	2.97	0.75	2.97	0.65	2.71	0.82	2.71	0.74	2.77	0.82
4. Steps performed in definite sequence?	3.62	0.54	3.59	0.55	3.36	0.76	3.52	0.63	3.66	0.5[illegible]	3.71	0.47	3.56	0.64	3.69	0.50	3.71	0.62	3.66	0.50	3.45	0.72
5. Built-in feedback?	2.95	1.13	2.82	1.13	3.24	1.01	3.13	0.96	2.87	1.0[illegible]	3.12	1.05	2.92	1.11	3.01	1.10	2.46	1.15	2.78	1.17	2.94	1.07
6. Time limit for completion?	2.16	0.54	2.25	0.62	2.12	0.33	2.23	0.50	2.23	0.48	2.18	0.39	2.18	0.50	2.26	0.47	2.08	0.58	2.15	0.46	2.21	0.48
7. Mental processing requirements?	2.03	0.83	1.89	0.76	1.72	0.84	1.77	0.84	1.92	0.81	1.71	0.47	1.87	0.74	1.74	0.77	1.98	0.76	1.77	0.65	1.82	0.69
8. Number of facts, terms, etc. memorize?	2.63	0.89	2.44	0.85	2.24	0.88	2.45	0.89	2.35	0.79	2.47	0.94	2.51	0.86	2.20	0.89	2.52	0.85	2.45	0.80	2.42	0.88
9. How hard are the facts or terms?	2.15	0.54	2.18	0.69	2.12	0.44	2.10	0.65	1.96	0.45	2.00	0.35	2.11	0.48	2.01	0.58	2.08	0.58	2.11	0.54	1.97	0.63
10. What are the motor control demands?	1.89	0.70	2.04	0.70	1.64	0.70	1.94	0.68	1.92	0.77	1.94	0.56	2.06	0.65	1.94	0.66	2.15	0.82	1.91	0.67	2.13	0.66

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ADDENDUM TO VOLUME I OF THE ARMY SYNTHETIC VALIDITY PROJECT: REPORT OF PHASE III RESULTS

An Investigation of the Use of Least Squares Validity Estimators and Correction Formulas when Population Values are Available for Predictor Intercorrelations

Rodney L. Rosse and Norman G. Peterson

Introduction

Two general approaches were used to create prediction functions for this project: (1) the synthetic validity method wherein the weights applied to predictors for each MOS were determined by an experimental design that used no information from the actual data, and (2) the empirical approach wherein least squares regression weights were computed for each MOS. As made plain in the body of the report (see Chapter 4), the objective was a direct comparison of the absolute and discriminant validities of the two approaches.

One troubling issue arises with the direct comparison of validity estimates from the two approaches. Namely, the estimates of validity for the two approaches are different statistics with different statistical properties. Therefore, it is not known with certainty that a direct comparison of validity is appropriate. How do the two statistics differ?

In general, the validity of a predictor for predicting a particular criterion is defined as the correlation of the predictor and the criterion in the population from which the sample was drawn. The synthetic validity approach yields weighted composites of predictors obtained directly from information external to the existing sample. This means that a simple correlation between any one synthetically formed composite and a criterion is a relatively good (unbiased) estimate of the validity of the composite for predicting that criterion. However, in the empirical approach, the weights used in forming predictor composites are determined using sample data; the least squares regression weights are computed using the sample data and the weights are optimized for idiosyncrasies of the specific sample which may not be characteristic of the population. The correlation between the least squares weighted composite and the criterion computed from sample data is often called the "foldback" correlation to denote

the fact that it is subject to these idiosyncrasies. It is well-known that the correlation between the least squares weighted composite and the criterion, when computed using the sample data, leads to an estimate that has substantial positive bias--the amount of bias varying inversely with the size of the sample.

Various "shrinkage" formulas have been proposed and tested for correcting the positive bias in the foldback correlation so as to produce a relatively unbiased estimate of the validity of the least squares composite. Several of the formulas have proven in practice and in Monte Carlo studies to yield estimates of the validity which have very little bias under a variety of conditions. Thus, if the appropriate formula could be used, the estimators of absolute validity for the two methods could both be made to be unbiased--making it more reasonable to directly compare the two methods.

In this project, as explained in Chapter 4, we applied three such formulas to foldback correlations:

1. Claudy (1978) Equation 12 (actually an estimate of the population Multiple R which is used to obtain an estimate of the validity coefficient);

2. Claudy (1978) Validity Estimate (uses Equation 12 to obtain a validity coefficient estimate); and

3. Rozeboom (1978) Equation #8.

We discussed these formulas and showed the results of their application to the samples in this project in Chapter 4 (see Tables 4.9 and 4.10).

All of the shrinkage formulas are based upon the practice of computing the regression weights and the foldback correlation using <u>sample data</u> for <u>both</u> predictor intercorrelations and predictor-criterion correlations, which is the case normally encountered. However, because of a unique opportunity, we were able to use "population" data for predictor intercorrelations rather than relying on separate sample estimates (from each MOS) of the predictor intercorrelations. Note that this method of computing regression weights, while it seems desirable, does not comply with the conditions for which the shrinkage formulas were developed.

To explicate further, in the usual case, the computation of least squares regression weights is accomplished by the following formula:

$$B = RXX^{-1}\ RXY \qquad [1]$$

where RXX is a matrix of intercorrelations between predictor variables and RXY is a column vector of correlations between each predictor variable and the criterion. The weights, B, are least squares weights for computing predicted scores (or composites) using predictor scores transformed to z-scores (mean = 0 and variance = 1). Then the foldback correlation can be readily computed as

$$r = (B' \; RXY)^{1/2} \qquad [2]$$

and it is this value which is used in the further computation of any one of the above three shrinkage formulas.

In equation [1], which defines the weights, B, the matrix of intercorrelations between predictors, RXX, is normally based upon the particular sample, or, in this case, the sample for a particular MOS. However, as noted just above, this was not done for the initial round of validation analyses. The matrix, RXX, was not used because it was not necessary to estimate the intercorrelations between predictors separately for each sample. For all practical purposes, the population values were known. Specifically, the predictor correlations that were to be found in the applicant population were estimated using a very large number of soldiers (all 7045 soldiers in the total sample). Conventional wisdom led us to substitute that "population" correlation matrix for the sample correlation matrix. Thus, the least squares regression weights were computed as follows:

$$BP = RHOXX^{-1} \; RXY \qquad [3]$$

where RHOXX is the population matrix of predictors. The foldback correlation was then computed in the same way as before (Equation [2]).

This opportunity, using the population correlations to compute the regression weights, is a luxury that is not ordinarily available. However, given that they were used, it seemed problematic to then apply the shrinkage formulas as though the sample correlations had been used in computing the regression weights. Given the divergence from the conditions assumed in the derivations for the shrinkage formulas, it seemed questionable to assume that the known properties of the resulting estimators of validity would apply in this case.

In summary, two troublesome issues arose in the attempts to compare the absolute and discriminant validities of the synthetic validity and the empirical validity approaches.

1. The estimation of validity differs between the two approaches, namely, the estimates using synthetically derived weights are not subject to bias from sample-specific idiosyncrasies as are the estimates using least squares regression weights (although attempts were made to correct the latter for bias by using known formulas).

2. For the initial set of analyses, the least squares estimation of weights and the resulting estimates of validity for the empirical approach were computed using population (rather than sample) correlations, which casts some doubt upon the properties of the validity estimators, i.e., the foldback correlations.

Since little is known about the characteristics of the validity estimates computed in the specific conditions of this study, we chose to investigate the possibility of altered properties by using the Monte Carlo method. In this method, the conditions of sampling are approximated by randomly generating samples from populations which are reasonably similar to those under which the "real" data of this project were obtained. Two questions motivated the Monte Carlo studies:

1. What effect does using the correlations of predictors from the population have upon the estimates of absolute validity, and

2. How is the index of discriminant validity affected by the mixture of estimators of two different types?

Finally, we also were concerned about the possible effect that the Batch A MOS versus Batch Z MOS distinction might have on our results. The criterion measures differ for the Batch A and Batch Z MOS, primarily in that the Batch A MOS included "hands-on" or work-sample tests and the Batch Z MOS did not include such measures. Therefore, we wished to run separate simulations for all the MOS together, the Batch A MOS alone, and the Batch Z MOS alone.

Method: Simulations

The Monte Carlo studies were designed to exactly duplicate the statistical processes used in the Synthetic Validity Project. Unlike the "real" project, however, we were able to draw the

samples from known populations.

The samples were generated as pseudo-random numbers drawn from populations with known correlations between predictors and between predictors and criteria. In order to make the populations similar to those in the Synthetic Validity research, we used the actual correlations realized in the Synthetic Validity sample and assumed them to be a population, that is, the populations sampled were based upon the following:

a. RHOXX, which is a 26 by 26 matrix of population correlations between predictors, was taken to be the correlations of predictors based upon 7045 cases (and corrected for range restriction, as explained in Chapter 4, p. 4-6), and

b. RHOXY, which is a 26 by 1 vector of mean correlations of each predictor with the Core Technical Proficiency criterion score or the Overall Performance criterion score. The means were computed across all 18 MOS or across 9 MOS when only Batch A or Batch Z MOS were included. All correlations had been corrected for range restriction.

Thus, the pseudo-random samples of observations were generated from a population in which the correlations among predictors are identical to that used in the Synthetic Validity research, but the correlations of the 26 predictors with the Core Technical or Overall Performance criterion (i.e., the predictor's individual validity coefficients) are set to the same value for all MOS--namely, the mean computed across all MOS. This simulates the condition of absolute validity nearly identical to that observed in the actual Synthetic Validity data, but discriminant validity equals zero--unlike the condition observed in the actual data. Discriminant validities of .07 for the Core Technical criterion and .04 for the Overall Performance criterion were found when RHOXX was used in the validation analyses (see Addendum Table 5).

The population regression weights and the population multiple correlation can be computed using RHOXX and RHOXY as follows:

$$\text{BPOP} = \text{RHOXX}^{-1}\ \text{RHOXY}$$

and

$$\text{rpop} = (\ \text{BPOP}'\ \text{RHOXY}\ )^{1/2}$$

where BPOP is the 26 by 1 vector of true regression weights and rpop is the population multiple correlation.

For each MOS, a sample of n_i multivariate observations was drawn from the population where n_i is the sample size realized for the i^{th} MOS in the Synthetic Validity study. (See Table 4.1 in Chapter 4 for a list of the sample sizes, which varied from 69 to 597.)

Thus, for each of the MOS, it was possible to obtain "sample" correlation matrices:

RXX_i = 26 by 26 matrix of the correlations of predictors based upon n_i pseudo-random observations for the i^{th} MOS, and

RXY_i = 26 by 1 vector of the correlations of n_i pseudo-random criterion scores with each of the 26 predictors in the i^{th} MOS.

Regression weights were obtained in two ways:

1. The "usual" way in which the sample correlations for both predictors and criteria were used, i.e.,

   $$B_i = RXX_i^{-1}\ RXY_i,$$

   and,

2. Substituting the population correlations, RHOXX, in place of the sample correlations, RXX_i, in the computation of weights, i.e.,

   $$BP_i = RHOXX^{-1}\ RXY_i.$$

The reason for computing the weights in both ways, as explained in the introduction to this section, is that the first way is the usual way to do it while the second way was tried out in the Synthetic Validity Project research, due to the availability of population correlations for predictors.

For each of the randomly generated samples, eight statistics were computed, four for each of the two sets of weights, B_i and BP_i.

1. Two foldback correlations which are the correlations of each composite with the criterion in the sample, i.e.,

$$rf_i = (B_i' \ RXY_i)^{1/2}$$

and

$$rpf_i = (BP_i' \ RXY_i)^{1/2}.$$

2. Two Claudy estimates of the population multiple correlation coefficient:

rc_i = the correlation obtained by applying Claudy Equation 12 (1978) to rf_i, and

rpc_i= the correlation obtained by applying Claudy Equation 12 to rpf_i.

3. Two Rozeboom estimates of the validity coefficient:

rr_i = the correlation obtained by applying Rozeboom Equation 8 (1978) to rf_i,

and

rpr_i= the correlation obtained by applying Rozeboom Equation 8 to rpf_i.

4. Two "True" validities, obtained by applying each set of weights to the population from which the samples were drawn:

$$v_i = (B_i' \ RHOXY)(B_i' \ RHOXX \ B_i)^{-1/2}$$

and

$$vp_i = (BP_i' \ RHOXY)(BP_i' \ RHOXX \ BP_i)^{-1/2}.$$

Of course, it is not ordinarily possible to compute the last pair of statistics, the true validities, because the populations are not routinely available.

For sampling conditions corresponding to each group/criterion set, we computed the mean of these coefficients across all MOS. These means are the absolute validities. We also computed the mean off-diagonal validities, that is, the mean of the validity coefficients obtained by applying the weights derived for a given MOS to the other MOS:

$$cv_{ij} = (B_i' \ RXY_j)(B_i' \ RHOXX \ B_i)^{-1/2}$$

$$cvp_{ij} = (BP_i' \ RXY_j)(BP_i' \ RHOXX \ BP_i)^{-1/2}$$

(Note that if i=j then $cv_{ii} = rf_i$ and $cvp_{ii} = rpf_i$.)

We completed this process 30 times or realizations (as the repetitions are sometimes labeled in Monte Carlo studies) and then computed the means and standard deviations of the statistics across the 30 realizations.

After obtaining the mean values for the various coefficients, we could then compute absolute and discriminant validities just as we did in all the other Synthetic Validity research. The mean of the "shrunken" validities is taken as the absolute validity and the discriminant validity is obtained by subtracting the mean of the off-diagonal validity coefficients from the absolute validity.

Results: Simulations

Addendum Table 1 shows a summary of the Monte Carlo simulation runs. There are six sets of summaries, one for each of the Group/Criterion conditions: All MOS, Batch A MOS, or Batch Z MOS for the Overall Criterion or the Core Technical Criterion. Items to note in this table are the standard deviations for the coefficients. These are the standard deviations for the coefficients computed across the 30 realizations and indicate the amount of sampling error incurred in the Monte Carlo simulations. Note that the standard deviation is zero for the "true multiple correlation" since there is only one such value for each set. Almost all of the standard deviations are less than .02, with the exception of several coefficients for the simulated Batch Z MOS, which are as high as .0342--indicating that there is more sampling error for that condition. Even so, the largest standard error of any mean coefficient is .006 (for the Rozeboom #8 RHOXX Batch Z/Overall condition, standard error = .0342/square root of 30), .pa

Addendum Table 1

Means and Standard Deviations of Foldback, Rozeboom Equation #8 Corrected, Claudy Equation #12 Corrected, True Validity, Off-Diagonal Validity Coefficients, and True Multiple Correlations

		Population *r*'s (RHOXX)						Sample *r*'s (RXX)				
Simulated Group/ Criterion		Fold-back	Rosebm #8	Claudy #12	True Valid.	Off-Diag.	True Mult *R*	Fold-back	Rosebm #8	Claudy #12	True Valid.	Off-Diag.
All MOS/	Mn	.7038	.6290	.6711	.5905	.5901	.6435	.6838	.5946	.6452	.6014	.6013
Overall	SD	.0084	.0181	.0114	.0045	.0123	.0000	.0068	.0142	.0092	.0046	.0117
Batch A/	Mn	.6758	.6221	.6514	.5965	.5965	.6351	.6614	.6043	.6355	.6078	.6079
Overall	SD	.0105	.0129	.0116	.0041	.0142	.0000	.0085	.0106	.0094	.0028	.0135
Batch Z/	Mn	.7360	.6424	.6953	.5913	.5905	.6581	.7096	.5895	.6591	.6034	.6028
Overall	SD	.0164	.0342	.0228	.0066	.0207	.0000	.0111	.0281	.0162	.0069	.0199
All Mos/	Mn	.7170	.6442	.6850	.6087	.6087	.6600	.6962	.6077	.6583	.6208	.6207
Core Tech	SD	.0077	.0160	.0103	.0046	.0120	.0000	.0061	.0158	.0090	.0044	.0122
Batch A/	Mn	.6726	.6180	.6478	.5910	.5913	.6302	.6588	.6010	.6326	.6024	.6026
Core Tech	SD	.0105	.0132	.0117	.0041	.0132	.0000	.0090	.0113	.0100	.0031	.0126
Batch Z/	Mn	.7744	.7063	.7441	.6344	.6356	.6983	.7430	.6475	.7014	.6498	.6510
Core Tech	SD	.0136	.0251	.0181	.0063	.0150	.0000	.0092	.0182	.0123	.0063	.0145

Note. Coefficients computed using population correlations of predictors (RHOXX) and sample correlations of predictors (RXX): From a simulation of the Synthetic Valdity Project data base for the case with similar absolute validity and with zero discriminant validity.

and the more typical size is .002. Thus, we think 30 realizations were more than sufficient to allow the comparisons that we wished to make.

Addendum Table 1 is fairly dense, and it is easier to understand the results if the salient statistics are broken into separate tables. Addendum Table 2 shows the foldback correlations for the six conditions computed using RHOXX and RXX. Also shown are the "true multiple correlations" so that the relative bias of the two foldbacks can be evaluated. Examination of this table shows that the foldbacks computed using the population correlations are higher than the foldbacks computed using the sample correlations for all conditions, and therefore exhibit more bias (i.e., they are more discrepant from the true multiple correlation, by .01 to .03). The greatest bias appears for the simulated Batch Z conditions using the population correlation. Since all the correction formulas are based on the foldback correlations, it is evident from this table that the coefficients based on the computations using population predictor correlations (RHOXX) will show more bias than those based on sample predictor correlations (RXX).

Addendum Table 3 shows the Claudy Equation #12 coefficients with the true multiple correlations for the six conditions. The same pattern of results holds as did for Addendum Table 2, that is, the Claudy coefficients based on computations using RHOXX show more positive bias than do the Claudy coefficients based on computations using RXX, for all conditions. Indeed, the "sample" Claudy equation is very close to the true multiple correlation in all conditions, whereas the bias for the population Claudy equation shows positive bias ranging from about .01 to .07. Again, the bias is higher for the simulated Batch Z conditions.

Addendum Table 4 shows the Rozeboom Equation #8 estimates, intended to estimate the validity of the least squares equations, compared to the "true validities" for the six conditions. Again, the same pattern of results holds: the estimates based on coefficients computed using RHOXX show positive bias ranging from .02 (Batch A/Overall) to .08 (Batch Z/Core Tech). Note that the Rozeboom equation estimates based on computations using sample predictor correlations show a slight negative bias, about -.01 in four of the six conditions, but are much closer to the "true validity" in all conditions. Again, it appears that the bias is most severe for the simulated Batch Z conditions.

These consistent results demonstrate that use of RHOXX, the population predictor intercorrelations, rather than RXX, the sample predictor intercorrelations, in computing least squares equations leads to a positive bias in the foldback correlation.

Addendum Table 2

Foldback Correlations Computed Using Population Correlations of Predictors (RHOXX) and Using Sample Correlations of Predictors (RXX) for Six MOS/Criterion Combinations

Simulated Group/ Criterion	Population Foldback	Sample Foldback	True Multiple *R*
All MOS/ Overall	.7038	.6838	.6435
Batch A/ Overall	.6758	.6614	.6351
Batch Z/ Overall	.7360	.7096	.6581
All Mos/ Core Tech	.7170	.6962	.6600
Batch A/ Core Tech	.6726	.6588	.6302
Batch Z/ Core Tech	.7744	.7430	.6983

Note. Coefficients computed using population correlations of predictors (RHOXX) and using sample correlations of predictors (RXX), from a simulation of the Synthetic Validity Project data base for the case with similar absolute validity and with zero discriminant validity.

Addendum Table 3

Claudy Equation #12 Estimates of Population Multiple Correlations and True Multiple Correlations for Six MOS/Criterion Combinations

Simulated Group/ Criterion	Population Claudy #12	Sample Claudy #12	True Multiple *R*
All MOS/ Overall	.6711	.6452	.6435
Batch A/ Overall	.6514	.6355	.6351
Batch Z/ Overall	.6953	.6591	.6581
All Mos/ Core Tech	.6850	.6583	.6600
Batch A/ Core Tech	.6478	.6326	.6302
Batch Z/ Core Tech	.7744	.7014	.6983

Note. Coefficients computed using population correlations of predictors (RHOXX) and using sample correlations of predictors (RXX), from a simulation of the Synthetic Validity Project data base for the case with similar absolute validity and with zero discriminant validity.

Addendum Table 4

Rozeboom Equation #8 Estimates of Validities and True Validities for Six MOS/Criterion Combinations

Simulated Group/ Criterion	Population Rozeboom #8	Population True Validity	Sample Rozeboom #8	Sample True Validity
All MOS/ Overall	.6290	.5905	.5946	.6014
Batch A/ Overall	.6221	.5965	.6043	.6078
Batch Z/ Overall	.6424	.5913	.5895	.6034
All Mos/ Core Tech	.6442	.6087	.6077	.6208
Batch A/ Core Tech	.6180	.5910	.6010	.6024
Batch Z/ Core Tech	.7063	.6344	.6475	.6498

Note. Coefficients computed using population correlations of predictors (RHOXX) and using sample correlations of predictors (RXX), from a simulation of the Synthetic Validity Project data base for the case with similar absolute validity and with zero discriminant validity.

This, in turn, leads to a positive bias in the estimates of population multiple correlations and population validity coefficients for the conditions encountered in the Synthetic Validity research.

Addendum Table 5 demonstrates this bias in the values of the observed absolute validity coefficients and the discriminant validity index. The first column in this table shows the actual, observed values for absolute and discriminant validity, using the Rozeboom correction on coefficients computed from least squares equations using RHOXX. The second column presents values for the same coefficients and conditions, except that they come from a population that **actually has zero discriminant validity by design**, i.e., from the simulations. Note that there are positive values for discriminant validity, which should equal zero, for these conditions, indicating the extent of bias that has occurred. For example, for the All MOS/Overall condition the observed data show absolute and discriminant validity values of .63 and .04, respectively, and the zero discriminant validity values are the same. Thus, the appearance of discriminant validity for this condition appears to be attributable to the positive bias in the calculation of least squares equations using RHOXX. Further evidence for this is shown in the third column. This column shows the Rozeboom coefficients for the zero discriminant validity simulation when the least squares equations are computed using the sample predictor intercorrelations (RXX). Note that there is a much smaller, slightly negative bias (about -.01 in four of the conditions, and no bias for two of the conditions).

Thus, the answer to our first research question, what is the effect of using RHOXX in computing least squares equations on the estimates of absolute validity, is that the estimates are positively biased, which in turn leads to a positive bias in the index of discriminant validity, our second research question. Recall that this index is simply the difference between the absolute validity and the mean off-diagonal validity, which does not include any foldback correlations.

This finding of positive bias held across all Simulated Group/Criterion combinations, but was most pronounced for Batch Z, compared to Batch A or All MOS. One possible explanation for this finding is the difference in Batch Z and Batch A sample sizes, which were used in the simulation. The mean sample size for the nine Batch Z MOS is 296 (standard deviation = 143, range = 69 to 544) compared to 448 for the Batch A MOS (standard deviation = 82, range = 289 to 597).

Addendum Table 6 provides some more information bearing on the relationship of sample size to these results. The table

Addendum Table 5

Absolute and Discriminant Validity Coefficients Obtained Using Rozeboom Equation #8 Estimates of Validities for Six MOS/Criterion Considerations

Simulated Group/ Criterion	Observed Rozeboom #8	Simulated Zero Disc. Rozeboom #8 Using RHOXX	Simulated Zero Disc. Rozeboom #8 Using RXX
All MOS/ Overall	.63/.04	.63/.04	.59/-.01
Batch A/ Overall	.60/.00	.62/.02	.60/-.01
Batch Z/ Overall	.66/.09	.64/.05	.59/-.01
All Mos/ Core Tech	.67/.07	.64/.03	.61/-.01
Batch A/ Core Tech	.63/.06	.62/.03	.60/.00
Batch Z/ Core Tech	.70/.08	.71./07	.65/.00

Note. Computed using population correlations of predictors (RHOXX) as observed in the Synthetic Validity Project data base for six MOS/Criterion combinations, the corresponding coefficients from a simulation of the Synthetic Validity data base with similar absolute validity but with zero discriminant validity, and Rozeboom estimates computed using sample correlations of predictors (RXX) for the zero discriminant validity simulation.

Addendum Table 6

Bias of Rozeboom and Claudy Estimators by Size of Group: Empirical Results for 30 Realizations of the Monte Carlo Study Sampling from the Population Corresponding to the Overall Performance Criterion with 26 Predictors for 18 Group Sizes Which Correspond to the Synthetic Validity Project Sample Sizes of MOS

(Population Multiple Correlation = .6435)

Sample Size	Population *r*'s (RHOXX) Fold-back	Rozeboom #8	Rozeboom Bias	True Valid.	Claudy # 12	Claudy Bias	Sample *r*'s (RXX) Fold-back	Rozeboom #8	Rozeboom Bias	True Valid.	Claudy #12	Claudy Bias
69	.8739	.6490	.1701	.4788	.7862	.1427	.7994	.4179	.0620	.4799	.6522	.0087
123	.7686	.5941	.0606	.5335	.6961	.0526	.7278	.5194	-.0257	.5451	.6402	-.0033
203	.7283	.6252	.0522	.5729	.6824	.0389	.7042	.5892	.0023	.5869	.6531	.0096
238	.7166	.6266	.0481	.5785	.6763	.0328	.6886	.5869	-.0092	.5961	.6432	-.0003
289	.7092	.6353	.0428	.5925	.6759	.0324	.6873	.6061	-.0001	.6063	.6508	.0073
338	.7041	.6409	.0393	.6017	.6755	.0320	.6845	.6159	.0048	.6111	.6535	.0100
340	.6851	.6171	.0219	.5952	.6543	.0108	.6726	.6011	-.0028	.6039	.6403	-.0032
368	.6907	.6299	.0342	.5957	.6632	.0197	.6744	.6095	-.0027	.6122	.6450	.0015
392	.6802	.6212	.0183	.6029	.6534	.0099	.6686	.6068	-.0072	.6139	.6405	-.0030
394	.6853	.6281	.0298	.5983	.6593	.0158	.6705	.6096	-.0011	.6106	.6428	-.0007
427	.6808	.6272	.0237	.6035	.6565	.0130	.6686	.6124	-.0045	.6169	.6430	-.0005
444	.6865	.6364	.0293	.6072	.6637	.0202	.6701	.6167	-.0032	.6199	.6458	.0023
464	.6754	.6254	.0164	.6090	.6526	.0091	.6646	.6125	-.0060	.6185	.6409	-.0026
478	.6763	.6280	.0193	.6087	.6543	.0108	.6674	.6175	-.0001	.6176	.6446	.0011
491	.6736	.6263	.0174	.6089	.6520	.0085	.6626	.6133	-.0064	.6197	.6401	-.0034
507	.6807	.6364	.0258	.6107	.6605	.0170	.6641	.6169	-.0036	.6205	.6426	-.0009
544	.6748	.6328	.0181	.6146	.6556	.0121	.6659	.6224	-.0002	.6226	.6460	.0025
597	.6794	.6422	.0263	.6158	.6624	.0189	.6676	.6286	.0047	.6239	.6498	.0063
Means	.7038	.6290	.0385	.5905	.6711	.0276	.6838	.5946	-.0068	.6014	.6452	.0017

shows the results of one of the six Monte Carlo studies broken down into sample sizes that correspond to the sample sizes for the 18 MOS in the Synthetic Validity Project. The results are rank ordered by group size. The smallest sample size is 69 and the largest is 597. The entries are mean values based upon 30 realizations each, i.e., 30 pseudo-random samples of the indicated size drawn from the population corresponding to the Overall Performance criterion with no discriminant validity.

As expected, the foldback correlations decrease and true validities increase as sample size increases. Moreover, the foldback coefficients for the weights computed using RHOXX are consistently higher than the foldback coefficients for the weights computed using the 30 independent sample correlation matrices, RXX (compare columns two and eight). The magnitude of this difference is related to the group size.

Somewhat unexpectedly, the true validities for the weights computed using RHOXX are slightly, but uniformly, lower than the true validities for the weights computed using the 30 independent RXX's (compare columns five and eleven).

The entries for bias for the Rozeboom Equation #8 estimator consist of the differences between each Rozeboom estimate of the validity and the corresponding true validity. The entries for bias for the Claudy Equation #12 estimator consist of the differences between each Claudy estimator and the population multiple correlation.

Clearly, the bias of both the Rozeboom and Claudy estimators is greater for the smaller group sizes when the weights are computed using RHOXX. It is reasonable to assume that the small reversals that occur in the downward trend in the bias columns for that condition can be attributed to sampling error since all samples were drawn from the same population, i.e., no difference in the correlations with the criterion (RXY).

Not surprisingly, both the Rozeboom and Claudy estimates seem to perform quite well. The bias with respect to their corresponding parameters is very small, with the exception of the case where the sample size is only 69.

Thus, it is reasonable to conclude that the phenomenon which causes bias in the estimation of validity when using population correlations between predictors in place of sample correlations is highly related to sample size.

In summary, these results indicate that using the population correlation matrix, RHOXX, in the computations of the regression

weights for each MOS rather than the MOS sample correlation matrix, RXX, is probably not the best way to proceed. The result seems to be that the true validity of composites computed from such weights is less than it would have been if the individual MOS sample correlation matrices had been used. Moreover, the estimates of validity seem to have been inflated by using RHOXX.

Since this phenomenon runs contrary to conventional wisdom and, indeed, contrary to the intuition of these researchers, we feel that, although these Monte Carlo results are convincing, they are limited to a specific set of conditions. We do not, for instance, know what to expect if the numbers of predictors or the population multiple correlation were varied. Thus, extrapolation of this phenomenon to other conditions may be premature and further study is indicated.

Comparison of Results Using RHOXX and RXX

Because of the findings reported above, we recomputed all the validation analyses. In the reanalysis, we used the MOS sample correlation matrices, RXX corrected for range restriction, in place of RHOXX which had also been corrected for range restriction. These are the results reported in Chapter 4. We also prepared some tables comparing the results obtained when the two different matrices (RHOXX and RXX) were used. We performed these comparisons primarily to determine the nature and size of the differences in analytic results when the two different types of predictor intercorrelation matrices were utilized.

To repeat, the initial set of analyses used RHOXX, the single, population matrix of predictor intercorrelations in computing least squares equations and validity coefficients for all equations (least square and synthetic). The second set of analyses used RXX, the sample matrix of predictor intercorrelations. Thus, there was a separate RXX for each MOS in the second set of analyses.

Addendum Tables 7 and 8 compare results for the computations of least squares equations and calculating the foldback correlations. Addendum Table 7 shows the foldback correlations for the least squares equations using all 26 predictors for each of the eighteen MOS, computed using RHOXX and using RXX, for both Core Technical Proficiency and Overall Performance. The mean values across all 18 MOS are nearly identical for Core Technical Proficiency and there is about .01 difference for Overall Performance. The standard deviations of the coefficient values, computed across the 18 MOS, are very similar for the two methods (and for

Addendum Table 7

Foldback Correlation Coefficients for Least Squares Equations Using 26 Predictors, Computed Using RHOXX and RXX

	Core Technical Proficiency 26 Predictors		Overall Performance 26 Predictors	
MOS	RHOXX	RXX	RHOXX	RXX
11B	.749	.747	.689	.699
12B	.707	.702	.688	.679
13B	.511	.492	.526	.498
16S	.604	.585	.661	.651
19K	.681	.677	.721	.708
27E	.844	.861	.839	.851
31C	.676	.685	.667	.633
51B	.947	.932	.943	.914
54B	.772	.776	.727	.728
55B	.735	.756	.652	.616
63B	.725	.747	.614	.623
67N	.847	.843	.827	.838
71L	.674	.681	.659	.650
76Y	.683	.686	.622	.613
88M	.638	.640	.624	.601
91A	.781	.784	.692	.680
94B	.772	.771	.641	.635
95B	.693	.676	.753	.733
Mean	.724	.725	.697	.686
S.D.	.096	.099	.094	.098

the two criteria).

Addendum Table 8 shows the same data when only the three ASVAB predictors are entered into the least squares equations. Once again, the mean coefficients are very similar across the two methods of computation. The standard deviation of the coefficients is slightly higher, about .01 for Core Technical and .02 for Overall, for the coefficients computed using RXX.

The results shown in Addendum Tables 7 and 8 indicate that the use of RHOXX versus the use of RXX made little difference in the observed results for least squares equations computed for each MOS. However, for the sake of completeness, the least squares equations developed using RHOXX are shown in the appendix to this addendum. These equations can be compared to their counterparts in Appendix E to the main body of the report, if the reader desires.

Addendum Table 9 shows the absolute and discriminant validities for predicting Core Technical Proficiency computed using RXX and RHOXX, for the various methods of forming prediction equations via synthetic techniques. Although predictor intercorrelations are not used in developing the synthetic equations (no sample predictor or criterion data are used to develop any synthetic equation), they are used in computing the validity coefficient for the equations. Therefore, we computed the absolute and discriminant validities using RHOXX and using RXX. Note that Addendum Table 9 also shows the absolute and discriminant validities for the least squares equations computed both ways. (We do not here describe the various types of synthetic equations, in the interests of conserving space. The interested reader may refer to Chapter 4 of the main report to find descriptions.)

The results in Addendum Table 9 are very similar across the two methods (RHOXX versus RXX). No difference is greater than .01 for either absolute or discriminant validity.

Addendum Table 10 shows the absolute and discriminant validities for predicting Overall Performance when using RHOXX and when using RXX. Once again, there is very little difference between the two methods for the synthetically formed equations. The largest difference is .01 for either absolute or discriminant validity. However, the least squares equation using all 26 predictors shows a .02 reduction in absolute validity (.63 vs .61) and a .03 reduction in discriminant validity (.04 vs .01) when the sample predictor correlations (RXX) are used.

For the most part, then, it seemed to make little difference whether RHOXX or RXX was used to form least squares equations or

Addendum Table 8

Foldback Correlation Coefficients for Least Squares Equations Using Three ASVAB Predictors, Computed Using RHOXX and RXX

	Core Technical Proficiency 3 ASVAB Predictors		Overall Performance 3 ASVAB Predictors	
MOS	RHOXX	RXX	RHOXX	RXX
11B	.694	.680	.592	.580
12B	.675	.671	.593	.581
13B	.409	.388	.402	.355
16S	.534	.508	.532	.514
19K	.627	.627	.614	.602
27E	.731	.787	.701	.760
31C	.625	.635	.596	.550
51B	.797	.837	.658	.741
54B	.705	.727	.639	.652
55B	.667	.713	.514	.497
63B	.654	.680	.488	.489
67N	.811	.811	.780	.797
71L	.591	.599	.546	.556
76Y	.645	.646	.548	.543
88M	.595	.595	.542	.516
91A	.720	.726	.586	.573
94B	.704	.695	.532	.514
95B	.639	.627	.669	.656
Mean	.657	.664	.585	.582
S.D.	.090	.103	.084	.104

Addendum Table 9

Absolute and Discriminant Validities Computed Using RHOXX and RXX by Synthetic Validity and Least Squares Methods: Core Technical Proficiency

	Using RHOXX		Using RXX	
	Absolute	Discriminant	Absolute	Discriminant
MOS Mean Importance				
$\overline{X}$ Validity	.55	.00	.55	.00
0-1 Attribute Weights	.63	.01	.63	.01
0-$\overline{X}$ Attribute Weights	.63	.01	.64	.01
ASVAB Reduction	.64	.00	.64	.00
MOS Threshold Importance				
$\overline{X}$ Validity	.56	.01	.56	.01
0-1 Attribute Weights	.61	.02	.62	.02
0-$\overline{X}$ Attribute Weights	.62	.02	.62	.02
ASVAB Reduction	.64	.00	.65	.00
Cluster Mean Importance				
$\overline{X}$ Validity	.55	.00	.55	.00
0-1 Attribute Weights	.63	.00	.63	.00
0-$\overline{X}$ Attribute Weights	.63	.00	.64	.00
ASVAB Reduction	.63	.00	.64	.00
Cluster Threshold Importance				
$\overline{X}$ Validity	.57	.01	.57	.01
0-1 Attribute Weights	.63	.01	.63	.01
0-$\overline{X}$ Attribute Weights	.63	.01	.64	.01
ASVAB Reduction	.64	.00	.64	.00
Least Squares, All 26 Predictors, Rozeboom Corrected	.67	.07	.67	.06
Least Squares, ASVAB Predictors Only, Rozeboom Corrected	.65	.03	.66	.03

Addendum Table 10

Absolute and Discriminant Validities Computed Using RHOXX and RXX by Synthetic Validity and Least Square Methods: Overall Performance

	Using RHOXX		Using RXX	
	Absolute	Discriminant	Absolute	Discriminant
MOS Mean Importance				
$\bar{X}$ Validity	.57	.00	.56	.00
0-1 Attribute Weights	.59	.00	.59	.00
0-$\bar{X}$ Attribute Weights	.59	.00	.59	.00
ASVAB Reduction	.57	.00	.57	.00
MOS Threshold Importance				
$\bar{X}$ Validity	.57	.00	.56	.00
0-1 Attribute Weights	.57	.01	.57	.01
0-$\bar{X}$ Attribute Weights	.57	.01	.57	.01
ASVAB Reduction	.57	.00	.57	.00
Cluster Mean Importance				
$\bar{X}$ Validity	.57	.00	.56	-.01
0-1 Attribute Weights	.59	.00	.59	.00
0-$\bar{X}$ Attribute Weights	.59	.00	.59	.00
ASVAB Reduction	.57	.00	.57	.00
Cluster Threshold Importance				
$\bar{X}$ Validity	.57	.00	.56	.00
0-1 Attribute Weights	.56	.00	.56	.00
0-$\bar{X}$ Attribute Weights	.57	.00	.56	.00
ASVAB Reduction	.57	.00	.57	.00
Least Squares, All 26 Predictors, Rozeboom Corrected	.63	.04	.61	.01
Least Squares, ASVAB Predictors Only, Rozeboom Corrected	.57	.01	.57	.01

to compute validity coefficients. The one case where a noticeable difference appeared was for predicting Overall Performance using all 26 predictors in a least squares equation. In that case, the results using RXX showed a lower value for the absolute validity which is the expected result given the findings of the simulations reported earlier in this addendum. For completeness, the appendix to this addendum includes tables showing validity coefficients computed using RHOXX for all synthetic and least squares methods. The interested reader can compare these to the tables in Appendix F to the main body of the report.

We also compared the RHOXX versus the RXX results obtained in the investigations of the synthetic and validity generalization models. Recall that we developed three types of "validity generalization" equations on the nine Batch A MOS and applied them to the nine Batch Z MOS (See Chapter 4, Section entitled "Comparison of Synthetic Validation Model to Validity Generalization Model"). These were labeled the Batch A "MOS-Match" Least Squares, the Batch A Cluster Least Squares, and the Batch A General Least Squares methods. In addition, we computed least squares equations for each of the Batch Z MOS using their sample data. These equations were called "Own Least Squares." Finally, we applied the various synthetic methods to the Batch Z MOS. Addendum Tables 11 through 14 present data comparing these methods when RHOXX is used and when RXX is used to develop equations (for least squares methods) and to compute validity coefficients (for both least squares and synthetic methods).

Addendum Table 11 shows the results when least squares equations developed on Batch A MOS are applied to Batch Z MOS, and RHOXX is used. Addendum Table 12 shows the same results when RXX is used. Note that all these coefficients are cross-validities and require no adjustments. The first comparison of note is the "transported" mean validity coefficient, i.e., the mean value of the coefficients obtained when the equation for a Batch A MOS is applied to the Batch Z MOS that it "matches." (In this case, match means that the Army Task Questionnaire profile for a Batch Z MOS correlated highest with that Batch A MOS profile). These coefficients are .64 when RHOXX is used and .67 when RXX is used (see footnotes in the two tables). Thus, we obtain higher transported validity when we use RXX.

A second noteworthy point concerns the variance in coefficients. When RXX is used, there is higher variance (compare the row standard deviations and the footnote standard deviations). This is understandable since a different RXX is used for each MOS in computing the validity of the least squares equations, whereas RHOXX is the same for each MOS.

Addendum Table 11

Validity Coefficients of Least Squares Equations Using RHOXX for Predicting Core Technical Proficiency, When Developed on Project A Batch A MOS and Applied to Project A Batch Z MOS: Highest Column Entries Underlined

Equation from Batch A MOS	Applied to Batch Z MOS										
	12B	16S	27E	51B	54B	55B	67N	76Y	94B	Mean	S.D.
11B	.64*	.54*	.68	.81	.69	.63	.76	.58	.63	.66	.08
13B	.57	.49	.62	.77	.62*	.59	.68	.47	.51	.59	.09
19K	.64	.52	.68	.82	.68	.60	.75	.58	.62	.65	.09
31C	.61	.51	.62*	.65	.68	.60	.70	.62	.64	.63	.05
63B	.60	.38	.57	.66	.59	.62	.70*	.45	.45	.56	.10
71L	.52	.55	.54	.68	.65	.46	.59	.60*	.71	.59	.08
88M	.66	.49	.60	.77*	.67	.63*	.76	.56	.62*	.64	.08
91A	.63	.53	.70	.80	.71	.63	.76	.59	.64	.67	.08
95B	.62	.54	.67	.84	.71	.60	.74	.60	.69	.67	.08
Mean	.61	.51	.63	.76	.67	.60	.72	.56	.61		
S.D.	.04	.05	.05	.07	.04	.05	.05	.06	.08		

*Validity coefficient for Batch Z MOS using the equation developed on Batch A MOS that is most similar in terms of ATQ Profile correlation; Mean = .64, S.D. = .06.

Addendum Table 12

Validity Coefficients of Least Squares Equations Using RXX for Predicting Core Technical Proficiency, When Developed on Project A Batch A MOS and Applied to Project A Batch Z MOS: Highest Column Entries Underlined

Equation from Batch A MOS	Applied to Batch Z MOS										
	12B	16S	27E	51B	54B	55B	67N	76Y	94B	Mean	S.D.
11B	<u>.64</u>*	.50*	.70	.88	.71	.67	.77	.56	.65	.68	.10
13B	.62	.50	.65	<u>.97</u>	.70*	<u>.70</u>	.78	.43	.59	.66	.15
19K	.63	.50	.70	.83	<u>.72</u>	.58	.83	.56	.65	.67	.11
31C	.59	.46	<u>.74</u>*	.86	<u>.72</u>	.66	.74	<u>.64</u>	.66	.67	.11
63B	.55	.31	.61	.80	.62	.62	.76*	.38	.47	.57	.15
71L	.45	.50	.54	.76	.63	.47	.59	.59*	<u>.70</u>	.58	.10
88M	<u>.64</u>	.45	.65	.84*	<u>.72</u>	.62*	.80	.55	.63*	.66	.11
91A	.59	.48	.67	.89	<u>.72</u>	.64	<u>.84</u>	.54	.64	.67	.13
95B	.60	<u>.53</u>	.66	.82	<u>.72</u>	.57	.75	.61	.68	.66	.09
Mean	.59	.47	.66	.85	.70	.61	.76	.54	.63		
S.D.	.06	.06	.05	.06	.04	.06	.07	.08	.06		

*Validity coefficient for Batch Z MOS using the equation developed on Batch A MOS that is most similar in terms of ATQ Profile correlation; Mean = .57, S.D. = .10.

Addendum Table 13 shows the validity coefficients for the four cluster equations and the general equation when applied to the Batch Z MOS, using RHOXX and using RXX. The underlined coefficients indicate the coefficients for the appropriate cluster equation for each MOS, that is, the cluster that the Batch Z MOS most closely matches in terms of its Army Task Questionnaire profile.

The means and standard deviations for the columns show that the general equation has identical results across RHOXX and RXX, which is not unexpected since the general equation averages across all Batch A MOS, and the results should be very similar to those using RHOXX. The four cluster equations show slightly higher mean validities and standard deviations where RXX is used (.01 to .03 higher). The mean "transported" validity coefficient, i.e., the mean of the appropriate cluster validities, is also slightly higher (.02) for RXX.

Addendum Table 14 summarizes the absolute and discriminant validity results for the Batch Z MOS when all the methods are applied using RHOXX and using RXX. The absolute validity for the "Own" least squares (i.e., the least squares equation developed on and applied to each Batch Z MOS) is the same, but the discriminant validity decreased from .08 to .05 for RXX. This means that the off-diagonal validity coefficients were higher, on average, for the RXX method.

The results for the three validity generalization methods are interesting. The general equation shows the same results when RHOXX and RXX are used, and we have already commented on that. However, the "MOS-Match" shows an increase of .03 in absolute validity and an increase of .02 in discriminant validity when RXX is used. The cluster method also shows an increase in absolute validity (.02), but a decline in discriminant validity. These results, though intriguing, should not be given undue weight since the differences are small. Still, the "MOS-Match" method does look better as a method for transporting validity when RXX is used compared to when RHOXX is used.

The synthetic equation results are within .01 across the two methods (RXX versus RHOXX), except for the discriminant validity for the "Top 5 Stepwise Reduction Method" (a .02 decrease for RXX) and the absolute validity for the 0-1 or 0-mean Attribute Weights combined with Threshold Component Weights (a .02 increase for RXX). Again, undue weight should probably not be placed on these small differences.

In general, the use of RHOXX versus RXX does not seem to cause any major difference in the analytic results for the data

Addendum Table 13

Validity Coefficients of General and Cluster Least Squares Equations for Predicting Core Technical Proficiency, Developed on Batch A MOS and Applied to Batch Z MOS,[1] Using RHOXX and Using RXX

	Validity Coefficients For:									
	General Equation		Mechanical Equation		Administrative Equation		Combat Equation		Electronics Equation	
Batch Z MOS	RHOXX	RXX	RHOXX	RXX	RHOXX	RXX	RHOXX	RXX	RHOXX	RXX
12B	.66	.65	.64	.64	.61	.60	.65	.64	.61	.61
16S	.55	.51	.45	.41	.57	.54	.55	.52	.51	.48
27E	.68	.74	.60	.66	.65	.71	.69	.73	.62	.71
51B	.82	.87	.73	.79	.78	.86	.85	.88	.66	.78
54B	.72	.74	.64	.68	.72	.72	.71	.73	.68	.70
55B	.65	.69	.64	.67	.57	.64	.63	.69	.60	.64
67N	.78	.78	.75	.77	.71	.73	.77	.77	.70	.70
76Y	.60	.61	.51	.52	.63	.63	.59	.59	.62	.62
94B	.66	.68	.55	.57	.71	.72	.65	.67	.64	.65
Mean	.68	.68	.61	.63	.66	.68	.68	.69	.63	.65
S.D.	.08	.08	.09	.11	.07	.09	.09	.10	.05	.08

	RHOXX	RXX
Mean of appropriate cluster coefficients (underlined) =	.66	.68
S.D. of appropriate cluster coefficients (underlined) =	.07	.08

Note. The predictor intercorrelations and the correlations of the 26 attributes with Core Technical Proficiency for the four clusters (M, A, C, E) were estimated by the pooled correlations of the Batch A MOS in each cluster and, for the General group, by pooling all of the Batch A correlations.

[1] Underlined coefficients indicate the appropriate cluster for each MOS.

Addendum Table 14

Absolute and Discriminant Validity Coefficients for Predicting Core Technical Proficiency (Computed Across Nine Batch Z MOS) for Equations Developed from Various Methods, Using RHOXX and RXX

	Absolute Validity		Discriminant Validity	
Equation	RHOXX	RXX	RHOXX	RXX
"Own" Least Squares	.70[1]	.70	.08	.05
Batch A "MOS-Match" Least Squares	.64	.67	.01	.03
Batch A Cluster Least Squares	.66	.68	.02	.01
Batch A General Least Squares	.68	.68	.00	.00
Full Synthetic (Mean Attribute Validities and MOS Mean Component Weights)	.56	.56	.00	-.01
Top 5 Stepwise Reduction	.57	.58	.00	-.02
0-1 Attribute Weights	.65	.66	.00	.00
0-Mean Attribute Weights	.66	.66	.00	.00
Threshold Component Weights	.59	.58	.01	.00
0-1 Attribute Weights and Threshold Component Weights	.63	.65	.02	.01
0-Mean Attribute Weights and Threshold Component Weights	.63	.65	.02	.02

[1] The absolute validities for "own" least squares equations were computed on coefficients adjusted with Rozeboom's Equation #8 (1978). Other absolute validities were computed on coefficients that did not require adjustments.

observed in this project. The simulation results did indicate that use of RHOXX would lead to a positive bias when least squares methods were used, but this result was only partially seen in these data.

ADDENDUM APPENDIX

Normalized Attribute Weights for Least Squares Equations and Validities of Synthetically Formed Prediction Equations for 18 MOS by Different Criterion Measures and by Different Weighting Methods, Using RHOXX Rather Than RXX

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Addendum Appendix Table 1

Least Squares Beta Weights for 18 MOS: Core Technical Proficiency, No Reduction

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.23	.11	.09	.09	-.01	.13	.07	.14	.01	.03	-.02	.03	.02	.04	-.11	-.02	.10	.04	.02	.12	-.04	.06	-.06	.02	-.05	-.03
12B	.18	.15	.02	.03	.04	-.04	.03	.40	-.02	.00	.02	-.03	-.01	.12	.02	.08	-.04	-.18	-.03	.05	-.06	.01	.02	-.04	.03	-.00
13B	.10	.09	.09	.13	.03	.03	.03	-.06	-.08	.04	.05	.04	-.02	-.02	.06	-.05	.06	.04	.13	.18	-.06	.03	-.03	-.02	-.02	-.10
16S	.22	.23	.25	.05	-.02	-.05	.01	-.16	.01	.05	-.01	.06	-.05	.01	-.03	.07	.10	-.10	-.06	.12	.02	.06	.02	-.03	-.12	-.03
19K	.07	.11	.13	.12	.05	.06	-.01	.24	.05	-.06	-.04	.08	-.07	.03	.03	-.07	.09	-.03	-.01	.15	.04	-.01	-.03	.04	.04	-.02
27E	.42	-.22	.31	.06	-.05	-.01	.01	-.01	.03	.12	-.08	.12	-.08	.20	.05	-.20	.01	-.00	.17	.20	-.17	-.32	-.02	.14	.13	-.11
31C	.25	.06	.37	-.04	-.03	-.02	.01	.17	.00	.06	-.10	-.01	-.00	.10	-.09	.01	.10	-.11	.12	-.09	.02	.12	.05	-.07	-.05	.03
51B	.23	.21	.16	.18	-.03	-.14	.14	.15	-.02	-.05	-.04	.18	.07	-.32	.15	-.14	.13	.22	.10	.17	-.12	-.13	-.26	.21	.25	-.11
54B	.33	.26	.15	-.06	.00	-.06	.05	.09	-.05	.13	-.13	.10	-.10	.21	.06	-.07	-.02	.00	.03	.02	-.04	-.03	.04	-.11	-.05	.02
55B	.42	.14	-.08	-.06	.03	-.00	-.04	.22	-.10	.25	-.06	-.06	-.07	-.10	-.00	.25	.02	-.01	.13	.01	-.05	.01	.08	-.03	-.15	-.02
63B	.02	.14	-.02	-.01	.06	.06	.01	.44	-.02	.01	.02	.05	-.05	.07	.05	-.10	.11	-.02	.30	.06	-.08	-.11	.02	-.00	-.06	-.01
67N	.22	.05	-.04	.21	-.06	-.08	.02	.48	-.02	.02	.10	-.00	.01	-.09	-.07	.11	.10	.03	-.03	-.02	.03	-.05	.13	-.10	.02	-.04
71L	.14	.30	.24	.08	.01	-.04	.06	-.11	-.06	.02	-.00	.02	-.04	.07	.04	-.04	.10	-.09	-.12	-.02	.01	.01	.07	.03	-.03	.03
76Y	.07	.08	.40	-.01	.06	.06	-.06	.18	-.00	-.07	-.06	-.02	-.04	.14	-.01	.02	.04	-.09	.02	-.04	-.07	-.04	.04	.10	-.03	.02
88M	-.04	.23	.10	-.08	.01	.08	.05	.39	.01	-.05	-.02	-.01	-.05	-.06	.02	.03	.11	-.03	.05	.06	.01	-.02	-.02	.04	-.00	-.05
91A	.34	.20	.08	.03	.06	.08	-.08	.08	-.03	.01	.01	.03	-.08	.03	.02	-.10	.19	.05	.08	.12	.04	-.11	.04	-.05	.05	-.05
94B	.05	.18	.33	.02	.10	-.07	.15	.22	-.11	-.01	.03	-.04	-.05	.03	-.05	.10	.00	-.01	-.09	-.07	.03	-.10	.05	.03	.09	.04
95B	.20	.25	.15	-.00	-.01	.01	.00	.11	-.05	.06	.00	.08	.01	-.04	.04	.04	.09	.00	-.02	-.03	.06	-.05	-.11	.08	-.01	-.02

Addendum Appendix Table 2

Least Squares Beta Weights for 18 MOS: Core Technical Proficiency, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	.23	0.23	0.31
12B	.19	0.11	0.44
13B	.03	0.17	0.25
16S	.18	0.37	0.01
19K	.11	0.23	0.36
27E	.40	0.26	0.14
31C	.16	0.35	0.18
51B	.31	0.28	0.30
54B	.30	0.27	0.21
55B	.31	-0.03	0.43
63B	-.13	0.06	0.71
67N	.20	0.11	0.57
71L	.22	0.48	-0.12
76Y	.13	0.47	0.10
88M	-.02	0.19	0.47
91A	.35	0.19	0.26
94B	.16	0.51	0.09
95B	.24	0.28	0.19

[1] Verb = Project A measure A1AVERBL.
[2] Numb = Project A measures A1AQUANT + B3CCNMSH.
[3] Mech = Project A measure A1ATECH.

Addendum Appendix Table 3

Least Squares Beta Weights for 18 MOS: Overall Performance, No Reduction

	Attribute																									
MOS	Verb	Reas	Numb	Spat	InPr	PS&A	Mem	Mech	E-LC	Prec	MJud	Dext	Athl	WkOr	Coop	Ener	Cons	Dom	Tool	Rugd	Prot	Tech	Sci	Lead	Art	Org
11B	.07	.11	.12	.11	-.00	.13	.08	.10	-.05	.05	-.03	.02	.03	.06	.00	-.02	.16	-.01	.00	.14	-.01	.02	-.04	.09	-.03	-.06
12B	.11	.00	.16	.06	.01	-.01	-.00	.25	-.01	.04	.02	.00	.02	.21	.06	.07	.15	-.20	-.16	.10	.03	.07	-.04	-.02	-.05	-.03
13B	-.04	.06	.15	.06	.06	.05	.02	.01	-.10	.11	.03	.05	-.03	.07	.06	-.03	.16	.05	.08	.11	.01	-.05	.04	-.01	.01	-.11
16S	.14	.23	.12	.16	-.02	-.03	.03	-.09	-.10	.06	.01	.04	.00	-.06	.05	.07	.23	-.03	-.13	.14	.04	.01	-.02	.08	-.04	-.08
19K	.02	.17	.15	.15	.04	-.04	.02	.18	.00	-.01	-.06	.10	.03	.05	.05	-.02	.22	-.11	-.07	.17	.00	-.05	-.03	.07	.08	-.10
27E	.40	-.26	.12	.25	-.06	-.05	.05	.06	.14	.00	.07	-.04	.01	.29	.04	-.24	.21	-.09	.04	.22	-.05	-.29	.00	.07	.18	-.07
31C	.06	.07	.29	.02	-.02	-.02	.07	.23	-.02	.12	-.14	.01	.06	.13	-.06	-.02	.22	-.10	.03	-.00	-.01	.07	-.03	-.03	-.01	-.05
51B	.00	.16	.31	.17	.10	-.05	.12	.12	.07	-.18	-.26	.15	.15	-.30	.11	-.07	.28	.13	.15	.35	-.11	-.13	-.33	.11	.43	-.20
54B	.20	.21	.16	.04	.01	-.06	.07	.11	-.08	.09	-.14	.12	-.02	.18	.06	-.02	.11	-.11	-.00	.02	-.01	-.08	.07	.04	-.07	-.04
55B	.19	.07	.09	-.10	.05	.02	.01	.17	-.20	.26	-.01	.01	-.08	-.06	.05	.22	.06	.05	.18	.01	-.02	.09	-.13	.08	-.20	-.01
63B	.02	.12	-.00	-.04	.00	.04	.03	.32	-.09	.03	.07	.06	-.01	.17	.09	.01	.19	-.15	.11	.01	-.02	-.01	-.03	.10	-.06	-.08
67N	.20	.03	.04	.06	.00	-.02	.04	.41	-.00	.03	-.00	-.03	.07	-.06	-.02	.12	.21	-.01	.03	-.02	.05	-.06	.07	-.07	.02	-.10
71L	.07	.12	.17	.06	-.00	.09	.04	.08	-.04	.02	-.05	.03	.07	.17	.05	-.06	.21	-.06	-.05	.10	-.01	-.02	-.03	.04	-.03	-.09
76Y	.04	.05	.26	.03	.06	.11	-.04	.15	-.07	.01	-.05	.03	-.04	.19	.06	-.01	.09	-.09	.01	.04	-.03	.02	-.05	.07	-.01	-.00
88M	-.12	.05	.13	.04	.00	.06	.06	.36	.03	-.01	.00	.02	-.02	.02	-.00	.05	.20	.01	.07	.04	-.06	.02	-.09	.11	.02	-.05
91A	.14	.14	.05	.04	.02	.08	-.03	.21	-.05	.02	-.00	.07	-.07	.13	.02	-.02	.21	.01	-.04	.15	.05	-.07	.02	-.08	-.00	.07
94B	-.10	.10	.37	.06	.03	-.02	-.01	.09	-.06	-.05	.06	-.01	-.07	.07	.03	.07	.09	.10	-.09	-.00	.08	-.12	.05	.03	.09	.05
95B	.07	.27	.11	.00	-.02	.05	.01	.26	-.04	-.02	.03	.08	.05	-.03	.05	.03	.15	.05	-.07	.09	-.01	-.03	-.10	.07	-.04	.01

Addendum Appendix Table 4

Least Squares Beta Weights for 18 MOS: Overall Job Performance, ASVAB Reduction

	Attribute		
MOS	Verb[1]	Numb[2]	Mech[3]
11B	0.11	0.29	0.25
12B	0.15	0.24	0.28
13B	-0.05	0.28	0.21
16S	0.21	0.33	0.03
19K	0.09	0.32	0.27
27E	0.42	0.16	0.18
31C	0.04	0.35	0.27
51B	0.13	0.34	0.26
54B	0.20	0.34	0.18
55B	0.07	0.09	0.40
63B	-0.02	0.11	0.43
67N	0.26	0.13	0.47
71L	0.12	0.33	0.15
76Y	0.10	0.34	0.17
88M	-0.09	0.25	0.43
91A	0.15	0.19	0.31
94B	0.02	0.51	0.00
95B	0.12	0.29	0.34

[1] Verb = Project A measure A1AVERBL.
[2] Numb = Project A measures A1AQUANT + B3CCNMSH.
[3] Mech = Project A measure A1ATECH.

Addendum Appendix Table 5

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.53	.42	.47	.56	.54	.50	.68	.58	.54	.51	.63	.50	.51	.51	.63	.57	.56
12B	.63	.53	.42	.47	.56	.54	.50	.68	.58	.54	.51	.63	.50	.51	.51	.63	.57	.56
13B	.64	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
16S	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.50	.63	.50	.51	.51	.63	.57	.56
19K	.64	.53	.42	.47	.57	.54	.50	.68	.59	.55	.51	.63	.50	.51	.51	.63	.57	.56
27E	.64	.53	.42	.47	.57	.54	.51	.68	.59	.55	.51	.63	.50	.52	.51	.63	.58	.56
31C	.64	.53	.42	.47	.57	.54	.51	.68	.59	.54	.51	.63	.51	.52	.51	.63	.58	.56
51B	.63	.53	.42	.47	.57	.54	.50	.68	.58	.54	.51	.63	.49	.51	.51	.63	.57	.56
54B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.50	.63	.51	.52	.51	.63	.58	.56
55B	.63	.53	.41	.47	.56	.54	.50	.68	.58	.54	.50	.63	.50	.51	.50	.63	.57	.56
63B	.64	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
67N	.64	.53	.42	.47	.57	.54	.51	.68	.59	.54	.51	.63	.51	.52	.51	.63	.58	.56
71L	.63	.52	.41	.47	.56	.54	.50	.68	.59	.54	.49	.62	.51	.52	.50	.63	.58	.56
76Y	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.50	.63	.51	.52	.51	.63	.58	.56
88M	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
91A	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.49	.62	.51	.52	.50	.63	.58	.56
94B	.63	.52	.41	.47	.56	.54	.50	.68	.59	.54	.49	.62	.51	.52	.50	.63	.58	.56
95B	.63	.52	.41	.47	.56	.54	.50	.68	.59	.54	.50	.62	.51	.52	.50	.63	.58	.56

Addendum Appendix Table 6

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.62	.46	.53	.63	.63	.55	.79	.68	.61	.57	.73	.55	.55	.57	.70	.63	.63
12B	.71	.62	.46	.53	.63	.63	.55	.79	.68	.61	.59	.74	.54	.55	.58	.70	.63	.63
13B	.72	.63	.46	.53	.64	.63	.55	.80	.68	.62	.59	.74	.53	.55	.58	.71	.63	.63
16S	.71	.62	.45	.53	.63	.63	.56	.80	.68	.61	.57	.73	.56	.56	.57	.70	.65	.64
19K	.72	.63	.46	.53	.64	.63	.56	.79	.68	.61	.59	.74	.54	.55	.58	.70	.63	.63
27E	.72	.63	.45	.53	.63	.63	.57	.80	.69	.62	.58	.74	.56	.57	.58	.71	.65	.64
31C	.72	.63	.45	.54	.63	.63	.57	.80	.69	.62	.57	.74	.57	.57	.58	.71	.66	.64
51B	.71	.63	.46	.52	.64	.64	.56	.79	.68	.63	.61	.75	.52	.55	.58	.71	.62	.63
54B	.72	.63	.45	.54	.63	.64	.57	.80	.69	.61	.57	.74	.57	.57	.58	.71	.66	.64
55B	.71	.62	.45	.53	.63	.63	.56	.79	.68	.61	.57	.73	.56	.56	.57	.71	.64	.63
63B	.71	.63	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.54	.56	.58	.70	.64	.63
67N	.71	.63	.45	.54	.63	.63	.57	.80	.69	.62	.57	.74	.57	.57	.58	.71	.66	.64
71L	.71	.61	.44	.53	.62	.62	.56	.79	.69	.60	.54	.72	.57	.57	.56	.70	.66	.64
76Y	.71	.62	.44	.54	.63	.63	.57	.80	.69	.61	.56	.73	.57	.58	.57	.71	.66	.64
88M	.71	.62	.45	.53	.63	.63	.56	.80	.68	.61	.57	.73	.56	.56	.57	.71	.65	.64
91A	.71	.62	.44	.54	.62	.63	.56	.80	.69	.60	.55	.72	.58	.57	.57	.70	.66	.64
94B	.70	.62	.44	.54	.62	.63	.58	.79	.69	.60	.55	.72	.58	.59	.56	.71	.67	.64
95B	.71	.61	.45	.53	.62	.62	.55	.79	.68	.60	.55	.72	.57	.57	.56	.70	.65	.64

Addendum Appendix Table 7

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.62	.46	.53	.63	.64	.55	.80	.68	.61	.58	.74	.54	.55	.57	.71	.64	.63
12B	.71	.63	.46	.53	.64	.64	.56	.80	.68	.62	.59	.75	.53	.55	.58	.71	.63	.63
13B	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.59	.75	.53	.55	.58	.71	.63	.63
16S	.72	.63	.46	.53	.63	.64	.56	.80	.69	.61	.57	.74	.56	.57	.58	.71	.65	.64
19K	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.59	.75	.53	.55	.58	.71	.63	.63
27E	.72	.64	.45	.53	.64	.63	.58	.80	.70	.63	.58	.75	.56	.57	.58	.72	.65	.64
31C	.72	.63	.45	.54	.64	.64	.58	.80	.70	.62	.57	.75	.56	.58	.58	.72	.66	.64
51B	.71	.64	.46	.52	.64	.64	.57	.80	.68	.63	.61	.76	.52	.55	.58	.71	.62	.63
54B	.72	.63	.45	.54	.64	.64	.57	.81	.70	.62	.57	.75	.57	.58	.58	.72	.66	.64
55B	.71	.63	.45	.53	.63	.64	.56	.80	.69	.62	.57	.74	.55	.57	.57	.71	.65	.64
63B	.72	.63	.46	.53	.64	.64	.57	.80	.68	.62	.59	.75	.54	.56	.58	.71	.64	.63
67N	.72	.64	.45	.53	.64	.64	.58	.81	.70	.62	.58	.75	.56	.58	.58	.72	.66	.64
71L	.71	.62	.44	.54	.63	.63	.56	.80	.69	.61	.55	.72	.57	.57	.57	.71	.66	.64
76Y	.71	.63	.44	.54	.63	.64	.58	.80	.70	.62	.56	.74	.57	.58	.57	.72	.66	.64
88M	.72	.63	.45	.53	.63	.64	.56	.80	.69	.62	.57	.74	.56	.57	.58	.71	.65	.64
91A	.71	.62	.44	.54	.63	.64	.57	.81	.70	.61	.55	.73	.58	.58	.57	.71	.67	.65
94B	.71	.62	.44	.54	.63	.64	.58	.80	.70	.61	.55	.73	.58	.59	.57	.71	.67	.64
95B	.71	.62	.45	.53	.63	.63	.56	.80	.69	.61	.55	.73	.57	.57	.57	.71	.66	.64

Addendum Appendix Table 8

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.55	.42	.47	.56	.57	.50	.67	.60	.54	.49	.64	.49	.50	.49	.62	.55	.53
12B	.64	.55	.42	.47	.56	.57	.50	.66	.60	.54	.49	.64	.48	.50	.49	.62	.55	.53
13B	.64	.55	.41	.47	.56	.56	.52	.66	.60	.55	.50	.64	.48	.51	.49	.62	.55	.53
16S	.64	.53	.40	.46	.56	.60	.50	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
19K	.64	.54	.41	.46	.56	.60	.51	.69	.59	.54	.51	.64	.48	.52	.49	.62	.56	.55
27E	.64	.54	.41	.46	.56	.60	.51	.69	.60	.54	.50	.63	.49	.52	.49	.62	.57	.55
31C	.64	.54	.41	.46	.56	.60	.51	.69	.60	.54	.50	.63	.49	.52	.49	.62	.57	.55
51B	.63	.53	.41	.46	.56	.60	.50	.68	.59	.54	.50	.63	.48	.51	.49	.62	.56	.54
54B	.64	.54	.40	.46	.56	.60	.50	.69	.60	.54	.50	.63	.49	.52	.49	.62	.57	.55
55B	.63	.53	.40	.46	.56	.60	.50	.68	.59	.53	.50	.63	.49	.52	.49	.62	.57	.54
63B	.64	.54	.41	.46	.56	.60	.51	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
67N	.64	.54	.41	.46	.56	.60	.51	.69	.60	.54	.50	.63	.49	.52	.49	.62	.57	.55
71L	.63	.54	.39	.47	.55	.57	.51	.68	.62	.54	.49	.61	.51	.53	.50	.63	.58	.56
76Y	.63	.54	.40	.47	.55	.58	.51	.69	.62	.55	.50	.61	.51	.53	.51	.63	.58	.56
88M	.64	.54	.41	.46	.56	.60	.50	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
91A	.64	.54	.41	.47	.55	.58	.51	.69	.62	.57	.50	.52	.52	.52	.50	.63	.59	.57
94B	.63	.54	.39	.47	.55	.57	.51	.68	.61	.54	.49	.61	.51	.53	.50	.63	.58	.56
95B	.63	.53	.40	.46	.56	.60	.50	.69	.59	.53	.49	.53	.49	.52	.49	.62	.57	.55

Addendum Appendix Table 9

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.55	.39	.47	.55	.56	.52	.64	.60	.54	.47	.65	.49	.52	.47	.62	.54	.54
12B	.63	.54	.39	.47	.55	.56	.52	.64	.60	.54	.47	.65	.49	.52	.47	.62	.54	.54
13B	.63	.55	.39	.47	.56	.56	.52	.64	.60	.54	.47	.65	.49	.52	.47	.62	.54	.54
16S	.65	.57	.42	.47	.56	.61	.52	.69	.63	.57	.53	.67	.50	.53	.51	.64	.59	.56
19K	.65	.57	.43	.47	.57	.61	.52	.69	.63	.57	.54	.67	.49	.53	.51	.64	.59	.56
27E	.65	.57	.43	.47	.57	.61	.53	.69	.64	.57	.54	.67	.49	.53	.51	.65	.59	.56
31C	.65	.57	.43	.47	.56	.61	.53	.69	.64	.57	.54	.67	.50	.53	.51	.65	.60	.56
51B	.62	.53	.38	.47	.56	.60	.49	.68	.59	.52	.45	.64	.51	.54	.47	.63	.57	.56
54B	.63	.53	.39	.47	.55	.60	.50	.71	.61	.51	.44	.63	.55	.55	.48	.62	.63	.57
55B	.59	.48	.37	.44	.52	.53	.44	.64	.54	.46	.43	.58	.49	.49	.45	.56	.55	.52
63B	.65	.57	.43	.47	.56	.61	.52	.69	.63	.57	.54	.67	.49	.53	.51	.64	.59	.56
67N	.65	.57	.43	.47	.56	.61	.52	.69	.64	.57	.54	.67	.50	.53	.51	.64	.59	.56
71L	.62	.53	.37	.48	.55	.58	.50	.68	.62	.53	.44	.61	.54	.55	.49	.64	.59	.58
76Y	.65	.57	.41	.48	.56	.58	.53	.69	.66	.58	.53	.64	.52	.54	.52	.65	.61	.58
88M	.65	.57	.42	.47	.56	.61	.52	.69	.63	.57	.53	.67	.49	.53	.51	.64	.59	.56
91A	.62	.54	.38	.48	.54	.59	.50	.68	.63	.56	.46	.62	.54	.54	.49	.64	.59	.59
94B	.62	.53	.37	.48	.54	.58	.50	.68	.62	.53	.44	.61	.54	.55	.48	.64	.59	.58
95B	.59	.48	.37	.44	.52	.53	.44	.64	.54	.46	.42	.57	.50	.49	.45	.56	.55	.52

Addendum Appendix Table 10

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
12B	.69	.65	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
13B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
16S	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
19K	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
27E	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
31C	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
51B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
54B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.53	.78	.53	.62	.56	.72	.68	.64
55B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
63B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
67N	.69	.65	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
71L	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
76Y	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
88M	.69	.65	.40	.51	.61	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
91A	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
94B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
95B	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64

Addendum Appendix Table 11

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.53	.42	.47	.57	.54	.49	.68	.58	.54	.51	.63	.49	.50	.51	.63	.57	.56
12B	.64	.53	.43	.47	.57	.54	.50	.68	.58	.55	.52	.64	.48	.50	.51	.63	.56	.56
13B	.64	.53	.43	.46	.57	.54	.49	.67	.58	.55	.53	.64	.47	.49	.51	.63	.55	.55
16S	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.50	.51	.51	.64	.57	.56
19K	.64	.53	.43	.47	.57	.54	.50	.68	.58	.55	.52	.64	.49	.50	.51	.63	.56	.56
27E	.65	.55	.43	.47	.58	.54	.52	.69	.60	.56	.54	.65	.49	.51	.52	.64	.57	.56
31C	.65	.55	.42	.48	.58	.55	.52	.69	.60	.56	.52	.65	.51	.52	.52	.64	.58	.57
51B	.65	.55	.43	.47	.58	.55	.51	.69	.59	.56	.54	.65	.49	.51	.52	.64	.56	.56
54B	.64	.54	.42	.47	.57	.54	.51	.68	.59	.55	.52	.64	.50	.51	.51	.64	.57	.56
55B	.64	.54	.42	.47	.57	.54	.51	.67	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
63B	.65	.54	.43	.47	.58	.54	.51	.68	.59	.56	.53	.65	.49	.51	.52	.64	.56	.56
67N	.65	.55	.42	.48	.58	.55	.52	.69	.61	.56	.52	.65	.51	.53	.52	.64	.59	.57
71L	.64	.53	.41	.48	.57	.55	.51	.68	.60	.54	.50	.63	.52	.52	.51	.64	.59	.57
76Y	.64	.53	.40	.48	.56	.55	.52	.68	.61	.53	.48	.63	.54	.54	.50	.64	.61	.57
88M	.64	.54	.43	.47	.57	.54	.51	.68	.59	.55	.52	.64	.49	.51	.51	.64	.57	.56
91A	.62	.51	.40	.46	.55	.53	.49	.67	.59	.52	.47	.61	.51	.51	.49	.62	.58	.56
94B	.63	.53	.40	.47	.56	.54	.52	.68	.60	.53	.48	.62	.53	.54	.50	.64	.61	.57
95B	.62	.51	.41	.46	.55	.53	.48	.67	.57	.53	.49	.61	.49	.50	.50	.62	.57	.55

Addendum Appendix Table 12

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To: 11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.57	.71	.52	.52	.56	.68	.61	.61
12B	.70	.61	.47	.51	.62	.62	.52	.77	.64	.60	.59	.73	.49	.51	.56	.68	.58	.60
13B	.69	.61	.47	.49	.63	.61	.50	.75	.61	.61	.63	.74	.43	.47	.56	.67	.52	.57
16S	.71	.62	.46	.52	.62	.61	.53	.77	.65	.60	.58	.72	.52	.53	.57	.69	.62	.61
19K	.71	.62	.46	.52	.63	.62	.53	.77	.66	.60	.60	.74	.51	.52	.57	.69	.60	.61
27E	.71	.63	.46	.52	.63	.61	.58	.78	.67	.63	.60	.75	.53	.54	.58	.70	.61	.61
31C	.72	.64	.45	.53	.64	.64	.58	.79	.69	.62	.58	.76	.54	.56	.58	.71	.64	.63
51B	.66	.61	.44	.45	.61	.59	.53	.71	.60	.62	.65	.74	.40	.47	.56	.65	.49	.54
54B	.72	.65	.45	.52	.63	.64	.56	.79	.68	.62	.59	.76	.54	.56	.59	.71	.66	.63
55B	.65	.60	.40	.48	.59	.59	.57	.71	.63	.60	.55	.71	.50	.54	.52	.67	.59	.57
63B	.70	.62	.46	.51	.62	.61	.53	.78	.65	.60	.61	.75	.49	.50	.57	.68	.58	.61
67N	.71	.64	.44	.53	.64	.63	.59	.80	.70	.64	.59	.75	.56	.58	.58	.73	.65	.64
71L	.69	.59	.42	.53	.60	.59	.54	.76	.67	.56	.52	.68	.56	.53	.54	.67	.62	.61
76Y	.64	.56	.36	.50	.57	.57	.57	.70	.65	.54	.45	.64	.57	.57	.50	.66	.64	.58
88M	.70	.63	.44	.52	.62	.62	.54	.77	.66	.61	.58	.76	.52	.53	.57	.70	.61	.62
91A	.64	.53	.39	.50	.55	.54	.48	.77	.64	.49	.46	.61	.58	.51	.51	.61	.65	.60
94B	.55	.49	.31	.47	.51	.51	.57	.62	.59	.45	.38	.55	.57	.58	.44	.58	.64	.52
95B	.69	.59	.45	.51	.61	.61	.52	.78	.65	.58	.54	.70	.54	.54	.55	.68	.63	.62

Addendum Appendix Table 13

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.61	.46	.52	.62	.62	.53	.78	.66	.59	.58	.72	.52	.53	.57	.69	.62	.61
12B	.70	.61	.47	.51	.63	.62	.52	.77	.64	.60	.59	.73	.49	.51	.56	.68	.58	.60
13B	.69	.62	.47	.49	.63	.62	.51	.75	.62	.61	.63	.75	.43	.48	.57	.67	.53	.58
16S	.71	.62	.46	.52	.63	.62	.53	.78	.66	.60	.58	.73	.52	.53	.57	.69	.62	.62
19K	.71	.62	.46	.52	.63	.63	.54	.77	.66	.61	.60	.74	.50	.52	.57	.69	.60	.61
27E	.71	.63	.46	.52	.64	.61	.58	.78	.67	.63	.61	.75	.52	.54	.58	.70	.60	.61
31C	.72	.65	.45	.53	.64	.64	.58	.79	.69	.63	.58	.76	.54	.56	.58	.71	.64	.63
51B	.66	.62	.44	.45	.61	.60	.53	.72	.61	.63	.65	.75	.40	.48	.56	.66	.50	.55
54B	.72	.65	.45	.52	.64	.64	.56	.79	.68	.63	.59	.77	.54	.57	.59	.71	.65	.64
55B	.65	.60	.39	.47	.59	.60	.58	.71	.63	.60	.55	.71	.49	.53	.52	.67	.58	.56
63B	.70	.63	.46	.51	.63	.62	.54	.78	.66	.61	.62	.76	.49	.51	.58	.68	.58	.61
67N	.71	.65	.44	.53	.64	.64	.59	.81	.71	.65	.60	.77	.55	.59	.59	.73	.65	.64
71L	.69	.59	.42	.53	.61	.61	.55	.77	.67	.57	.52	.69	.56	.54	.54	.68	.63	.62
76Y	.64	.56	.36	.50	.57	.59	.58	.71	.65	.54	.45	.64	.57	.57	.50	.66	.64	.58
88M	.70	.63	.44	.52	.62	.63	.55	.77	.66	.62	.58	.77	.51	.53	.57	.70	.61	.62
91A	.65	.55	.40	.51	.56	.56	.50	.78	.66	.51	.46	.63	.58	.52	.52	.62	.66	.61
94B	.54	.48	.29	.46	.49	.50	.56	.60	.57	.44	.36	.53	.55	.56	.42	.57	.62	.50
95B	.70	.60	.45	.52	.61	.62	.53	.79	.66	.59	.54	.71	.54	.54	.56	.69	.63	.62

Addendum Appendix Table 14

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & MOS Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.69	.65	.40	.51	.62	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
12B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.55	.78	.53	.62	.56	.72	.68	.64
13B	.69	.66	.40	.50	.62	.72	.62	.80	.70	.64	.56	.79	.52	.62	.57	.72	.67	.64
16S	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
19K	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.55	.78	.53	.62	.56	.72	.68	.64
27E	.69	.67	.40	.50	.62	.72	.61	.80	.70	.65	.57	.80	.51	.61	.57	.72	.67	.63
31C	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
51B	.69	.66	.40	.51	.62	.72	.62	.80	.70	.64	.56	.79	.52	.62	.57	.72	.67	.64
54B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
55B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.55	.78	.53	.62	.56	.72	.68	.64
63B	.69	.66	.40	.50	.62	.72	.62	.80	.70	.64	.56	.79	.52	.61	.57	.72	.67	.64
67N	.69	.66	.40	.50	.62	.73	.61	.80	.70	.64	.55	.79	.52	.61	.56	.72	.67	.64
71L	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.52	.77	.54	.62	.55	.72	.68	.64
76Y	.68	.64	.39	.52	.60	.73	.62	.79	.70	.62	.50	.76	.55	.63	.54	.71	.68	.64
88M	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.55	.78	.52	.62	.56	.72	.67	.64
91A	.68	.64	.39	.51	.60	.73	.62	.79	.70	.62	.51	.76	.54	.62	.54	.72	.68	.64
94B	.69	.64	.39	.52	.61	.73	.62	.79	.70	.62	.52	.76	.54	.63	.55	.72	.68	.64
95B	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64

Addendum Appendix Table 15

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
12B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
13B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
16S	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
19K	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
27E	.64	.53	.42	.47	.57	.54	.51	.68	.59	.54	.51	.63	.51	.52	.51	.63	.58	.56
31C	.64	.53	.42	.47	.57	.54	.51	.68	.59	.54	.51	.63	.51	.52	.51	.63	.58	.56
51B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
54B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
55B	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.50	.63	.51	.52	.50	.63	.58	.56
63B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
67N	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
71L	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.50	.63	.51	.52	.50	.63	.58	.56
76Y	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.50	.63	.51	.52	.50	.63	.58	.56
88M	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56
91A	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.50	.63	.51	.52	.50	.63	.58	.56
94B	.63	.53	.41	.47	.56	.54	.50	.68	.59	.54	.50	.63	.51	.52	.50	.63	.58	.56
95B	.63	.53	.42	.47	.57	.54	.50	.68	.59	.54	.51	.63	.50	.51	.51	.63	.57	.56

Addendum Appendix Table 16

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63
12B	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63
13B	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63
16S	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63
19K	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63
27E	.72	.63	.45	.53	.63	.63	.57	.80	.69	.62	.57	.74	.56	.57	.58	.71	.65	.64
31C	.72	.63	.45	.53	.63	.63	.57	.80	.69	.62	.57	.74	.56	.57	.58	.71	.65	.64
51B	.72	.63	.46	.53	.64	.63	.57	.80	.69	.62	.58	.74	.55	.56	.58	.71	.64	.63
54B	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63
55B	.71	.62	.44	.54	.63	.63	.57	.80	.69	.60	.55	.72	.58	.58	.57	.71	.66	.64
63B	.72	.63	.46	.53	.64	.63	.57	.80	.69	.62	.58	.74	.55	.56	.58	.71	.64	.63
67N	.72	.63	.46	.53	.64	.63	.57	.80	.69	.62	.58	.74	.55	.56	.58	.71	.64	.63
71L	.71	.62	.44	.54	.63	.63	.57	.80	.69	.60	.55	.72	.58	.58	.57	.71	.66	.64
76Y	.71	.62	.44	.54	.63	.63	.57	.80	.69	.60	.55	.72	.58	.58	.57	.71	.66	.64
88M	.72	.63	.46	.53	.64	.63	.57	.80	.69	.62	.58	.74	.55	.56	.58	.71	.64	.63
91A	.71	.62	.44	.54	.63	.63	.57	.80	.69	.60	.55	.72	.58	.58	.57	.71	.66	.64
94B	.71	.62	.44	.54	.63	.63	.57	.80	.69	.60	.55	.72	.58	.58	.57	.71	.66	.64
95B	.71	.62	.46	.53	.63	.63	.56	.80	.68	.61	.58	.74	.55	.56	.58	.71	.64	.63

Addendum Appendix Table 17

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.58	.74	.55	.56	.58	.71	.64	.64
12B	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.58	.74	.55	.56	.58	.71	.64	.64
13B	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.58	.74	.55	.56	.58	.71	.64	.64
16S	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.58	.74	.55	.56	.58	.71	.64	.64
19K	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.58	.74	.55	.56	.58	.71	.64	.64
27E	.72	.64	.45	.53	.64	.64	.58	.80	.70	.62	.58	.75	.56	.58	.58	.72	.65	.64
31C	.72	.64	.45	.53	.64	.64	.58	.80	.70	.62	.58	.75	.56	.58	.58	.72	.65	.64
51B	.72	.63	.46	.53	.64	.64	.57	.80	.69	.62	.59	.75	.55	.57	.58	.71	.64	.64
54B	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	58	.74	.55	.56	.58	.71	.64	.64
55B	.71	.62	.44	.54	.63	.64	.57	.80	.70	.61	.55	.73	.58	.58	.57	.71	.66	.64
63B	.72	.63	.46	.53	.64	.64	.57	.80	.69	.62	.59	.75	.55	.57	.58	.71	.64	.64
67N	.72	.63	.46	.53	.64	.64	.57	.80	.69	.62	.59	.75	.55	.57	.58	.71	.64	.64
71L	.71	.62	.44	.54	.63	.64	.57	.80	.70	.61	.55	.73	.58	.58	.57	.71	.66	.64
76Y	.71	.62	.44	.54	.63	.64	.57	.80	.70	.61	.55	.73	.58	.58	.57	.71	.66	.64
88M	.72	.63	.46	.53	.64	.64	.57	.80	.69	.62	.59	.75	.55	.57	.58	.71	.64	.64
91A	.71	.62	.44	.54	.63	.64	.57	.80	.70	.61	.55	.73	.58	.58	.57	.71	.66	.64
94B	.71	.62	.44	.54	.63	.64	.57	.80	.70	.61	.55	.73	.58	.58	.57	.71	.66	.64
95B	.72	.63	.46	.53	.64	.64	.56	.80	.68	.62	.58	.74	.55	.56	.58	.71	.64	.64

Addendum Appendix Table 18

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56
12B	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56
13B	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56
16S	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56
19K	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56
27E	.64	.54	.41	.46	.56	.60	.51	.69	.60	.54	.50	.63	.49	.52	.49	.62	.57	.55
31C	.64	.54	.41	.46	.56	.60	.51	.69	.60	.54	.50	.63	.49	.52	.49	.62	.57	.55
51B	.64	.54	.41	.46	.56	.60	.50	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
54B	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56
55B	.64	.54	.41	.47	.55	.58	.51	.69	.63	.57	.50	.62	.51	.52	.50	.63	.59	.57
63B	.64	.54	.41	.46	.56	.60	.50	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
67N	.64	.54	.41	.46	.56	.60	.50	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
71L	.64	.54	.41	.47	.55	.58	.51	.69	.63	.57	.50	.62	.51	.52	.50	.63	.59	.57
76Y	.64	.54	.41	.47	.55	.58	.51	.69	.63	.57	.50	.62	.51	.52	.50	.63	.59	.57
88M	.64	.54	.41	.46	.56	.60	.50	.69	.59	.54	.50	.63	.49	.52	.49	.62	.57	.55
91A	.64	.54	.41	.47	.55	.58	.51	.69	.63	.57	.50	.62	.51	.52	.50	.63	.59	.57
94B	.64	.54	.41	.47	.55	.58	.51	.69	.63	.57	.50	.62	.51	.52	.50	.63	.59	.57
95B	.63	.53	.38	.50	.55	.53	.53	.64	.62	.52	.45	.61	.54	.53	.49	.62	.60	.56

Addendum Appendix Table 19

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56
12B	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56
13B	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56
16S	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56
19K	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56
27E	.65	.57	.43	.47	.56	.61	.53	.69	.64	.57	.54	.67	.50	.53	.51	.65	.59	.56
31C	.65	.57	.43	.47	.56	.61	.53	.69	.64	.57	.54	.67	.50	.53	.51	.65	.59	.56
51B	.65	.57	.43	.47	.56	.61	.52	.69	.63	.57	.54	.67	.49	.53	.51	.64	.59	.56
54B	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56
55B	.63	.54	.38	.48	.54	.59	.50	.68	.63	.56	.46	.63	.54	.54	.49	.64	.59	.59
63B	.65	.57	.43	.47	.56	.61	.52	.69	.63	.57	.54	.67	.49	.53	.51	.64	.59	.56
67N	.65	.57	.43	.47	.56	.61	.52	.69	.63	.57	.54	.67	.49	.53	.51	.64	.59	.56
71L	.63	.54	.38	.48	.54	.59	.50	.68	.63	.56	.46	.63	.54	.54	.49	.64	.59	.59
76Y	.63	.54	.38	.48	.54	.59	.50	.68	.63	.56	.46	.63	.54	.54	.49	.64	.59	.59
88M	.65	.57	.43	.47	.56	.61	.52	.69	.63	.57	.54	.67	.49	.53	.51	.64	.59	.56
91A	.63	.54	.38	.48	.54	.59	.50	.68	.63	.56	.46	.63	.54	.54	.49	.64	.59	.59
94B	.63	.54	.38	.48	.54	.59	.50	.68	.63	.56	.46	.63	.54	.54	.49	.64	.59	.59
95B	.63	.55	.38	.49	.55	.53	.52	.64	.63	.55	.46	.62	.52	.53	.49	.63	.56	.56

Addendum Appendix Table 20

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
12B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
13B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
16S	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
19K	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
27E	.69	.65	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
31C	.69	.65	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
51B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
54B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64
55B	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
63B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
67N	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
71L	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
76Y	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
88M	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
91A	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
94B	.69	.65	.39	.51	.61	.73	.62	.79	.70	.63	.53	.77	.54	.62	.55	.72	.68	.64
95B	.69	.65	.40	.51	.61	.73	.62	.80	.70	.63	.54	.78	.53	.62	.56	.72	.68	.64

Addendum Appendix Table 21

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
12B	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
13B	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
16S	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
19K	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
27E	.65	.55	.43	.48	.59	.54	.53	.69	.60	.56	.54	.66	.50	.52	.53	.64	.58	.56
31C	.65	.55	.43	.48	.59	.54	.53	.69	.60	.56	.54	.66	.50	.52	.53	.64	.58	.56
51B	.65	.55	.43	.48	.58	.55	.52	.68	.60	.56	.53	.65	.50	.52	.52	.64	.57	.56
54B	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56
55B	.65	.56	.41	.49	.58	.56	.55	.70	.62	.56	.49	.65	.55	.56	.52	.66	.63	.58
63B	.65	.55	.43	.48	.58	.55	.52	.68	.60	.56	.53	.65	.50	.52	.52	.64	.57	.56
67N	.65	.55	.43	.48	.58	.55	.52	.68	.60	.56	.53	.65	.50	.52	.52	.64	.57	.56
71L	.65	.56	.41	.49	.58	.56	.55	.70	.62	.56	.49	.65	.55	.56	.52	.66	.63	.58
76Y	.65	.56	.41	.49	.58	.56	.55	.70	.62	.56	.49	.65	.55	.56	.52	.66	.63	.58
88M	.65	.55	.43	.48	.58	.55	.52	.68	.60	.56	.53	.65	.50	.52	.52	.64	.57	.56
91A	.65	.56	.41	.49	.58	.56	.55	.70	.62	.56	.49	.65	.55	.56	.52	.66	.63	.58
94B	.65	.56	.41	.49	.58	.56	.55	.70	.62	.56	.49	.65	.55	.56	.52	.66	.63	.58
95B	.64	.53	.43	.47	.57	.54	.50	.68	.59	.55	.52	.64	.49	.51	.51	.63	.57	.56

Addendum Appendix Table 22

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-1 Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61
12B	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61
13B	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61
16S	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61
19K	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61
27E	.71	.64	.45	.53	.63	.60	.60	.78	.68	.63	.58	.74	.54	.56	.58	.70	.62	.61
31C	.71	.64	.45	.53	.63	.60	.60	.78	.68	.63	.58	.74	.54	.56	.58	.70	.62	.61
51B	.69	.63	.44	.51	.61	.61	.54	.76	.65	.62	.59	.76	.50	.52	.57	.70	.59	.61
54B	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61
55B	.69	.63	.40	.55	.60	.63	.57	.79	.71	.61	.51	.73	.59	.59	.55	.72	.67	.65
63B	.69	.63	.44	.51	.61	.61	.54	.76	.65	.62	.59	.76	.50	.52	.57	.70	.59	.61
67N	.69	.63	.44	.51	.61	.61	.54	.76	.65	.62	.59	.76	.50	.52	.57	.70	.59	.61
71L	.69	.63	.40	.55	.60	.63	.57	.79	.71	.61	.51	.73	.59	.59	.55	.72	.67	.65
76Y	.69	.63	.40	.55	.60	.63	.57	.79	.71	.61	.51	.73	.59	.59	.55	.72	.67	.65
88M	.69	.63	.44	.51	.61	.61	.54	.76	.65	.62	.59	.76	.50	.52	.57	.70	.59	.61
91A	.69	.63	.40	.55	.60	.63	.57	.79	.71	.61	.51	.73	.59	.59	.55	.72	.67	.65
94B	.69	.63	.40	.55	.60	.63	.57	.79	.71	.61	.51	.73	.59	.59	.55	.72	.67	.65
95B	.71	.61	.46	.52	.62	.61	.53	.78	.66	.59	.58	.73	.52	.52	.57	.68	.62	.61

Addendum Appendix Table 23

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, 0-Mean Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62
12B	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62
13B	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62
16S	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62
19K	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62
27E	.71	.64	.45	.52	.64	.60	.60	.78	.68	.63	.59	.75	.53	.56	.58	.70	.62	.61
31C	.71	.64	.45	.52	.64	.60	.60	.78	.68	.63	.59	.75	.53	.56	.58	.70	.62	.61
51B	.69	.64	.44	.51	.61	.63	.55	.76	.65	.63	.59	.77	.49	.52	.57	.70	.59	.61
54B	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62
55B	.69	.64	.40	.54	.60	.66	.58	.80	.71	.62	.50	.74	.58	.59	.55	.73	.67	.65
63B	.69	.64	.44	.51	.61	.63	.55	.76	.65	.63	.59	.77	.49	.52	.57	.70	.59	.61
67N	.69	.64	.44	.51	.61	.63	.55	.76	.65	.63	.59	.77	.49	.52	.57	.70	.59	.61
71L	.69	.64	.40	.54	.60	.66	.58	.80	.71	.62	.50	.74	.58	.59	.55	.73	.67	.65
76Y	.69	.64	.40	.54	.60	.66	.58	.80	.71	.62	.50	.74	.58	.59	.55	.73	.67	.65
88M	.69	.64	.44	.51	.61	.63	.55	.76	.65	.63	.59	.77	.49	.52	.57	.70	.59	.61
91A	.69	.64	.40	.54	.60	.66	.58	.80	.71	.62	.50	.74	.58	.59	.55	.73	.67	.65
94B	.69	.64	.40	.54	.60	.66	.58	.80	.71	.62	.50	.74	.58	.59	.55	.73	.67	.65
95B	.71	.62	.46	.52	.62	.62	.54	.78	.66	.60	.59	.74	.52	.53	.57	.69	.62	.62

Addendum Appendix Table 24

Validities of Synthetically Formed Prediction Equations for 18 MOS: Core Technical Proficiency, Mean Attribute Validities & Cluster Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
12B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
13B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
16S	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
19K	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
27E	.69	.66	.40	.50	.62	.72	.62	.80	.70	.65	.56	.79	.51	.61	.57	.72	.67	.63
31C	.69	.66	.40	.50	.62	.72	.62	.80	.70	.65	.56	.79	.51	.61	.57	.72	.67	.63
51B	.69	.66	.40	.50	.62	.72	.61	.80	.70	.65	.56	.79	.52	.61	.56	.72	.67	.63
54B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64
55B	.68	.64	.39	.51	.60	.73	.61	.79	.70	.63	.51	.76	.54	.62	.54	.72	.68	.63
63B	.69	.66	.40	.50	.62	.72	.61	.80	.70	.65	.56	.79	.52	.61	.56	.72	.67	.63
67N	.69	.66	.40	.50	.62	.72	.61	.80	.70	.65	.56	.79	.52	.61	.56	.72	.67	.63
71L	.68	.64	.39	.51	.60	.73	.61	.79	.70	.63	.51	.76	.54	.62	.54	.72	.68	.63
76Y	.68	.64	.39	.51	.60	.73	.61	.79	.70	.63	.51	.76	.54	.62	.54	.72	.68	.63
88M	.69	.66	.40	.50	.62	.72	.61	.80	.70	.65	.56	.79	.52	.61	.55	.72	.67	.63
91A	.68	.64	.39	.51	.60	.73	.61	.79	.70	.63	.51	.76	.54	.62	.54	.72	.68	.63
94B	.68	.64	.39	.51	.60	.73	.61	.79	.70	.63	.51	.76	.54	.62	.54	.72	.68	.63
95B	.69	.66	.40	.51	.62	.73	.62	.80	.70	.64	.54	.78	.53	.62	.56	.72	.68	.64

Addendum Appendix Table 25

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.51	.65
12B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.51	.65
13B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.67	.56	.53	.55	.60	.51	.65
16S	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.56	.54	.55	.60	.51	.65
19K	.63	.57	.47	.54	.62	.61	.55	.63	.59	.51	.51	.67	.56	.53	.55	.60	.50	.65
27E	.63	.57	.47	.55	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.60	.51	.65
31C	.63	.57	.47	.55	.62	.61	.55	.63	.60	.50	.51	.66	.56	.54	.55	.60	.51	.65
51B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
54B	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.56	.54	.55	.60	.51	.65
55B	.63	.57	.47	.55	.62	.61	.54	.63	.59	.50	.51	.66	.56	.54	.55	.60	.51	.65
63B	.63	.57	.47	.54	.62	.61	.55	.63	60	.51	.51	.67	.56	.54	.55	.60	.51	.65
67N	.63	.57	.47	.55	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.60	.51	.65
71L	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.50	.66	.57	.54	.54	.60	.52	.65
76Y	.63	.57	.47	.55	.62	.61	.55	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
88M	.63	.57	.47	.55	.62	.61	.54	.63	.60	.51	.51	.66	.56	.54	.55	.60	.51	.65
91A	.63	.57	.47	.55	.62	.61	.55	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
94B	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.52	.65
95B	.63	.57	.47	.55	.62	.61	.54	.64	.60	.50	.51	.66	.57	.54	.54	.60	.52	.65

Addendum Appendix Table 26

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.58	.46	.56	.65	.65	.57	.69	.64	.51	.50	.72	.57	.54	.55	.61	.48	.69
12B	.65	.59	.46	.56	.65	.66	.57	.68	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
13B	.65	.59	.46	.56	.65	.66	.57	.69	.64	.51	.50	.73	.57	.54	.55	.61	.47	.69
16S	.65	.59	.46	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.54	.55	.61	.49	.70
19K	.65	.58	.45	.56	.64	.65	.57	.68	.64	.51	.50	.72	.57	.53	.55	.61	.47	.69
27E	.65	.59	.45	.57	.65	.65	.58	.68	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
31C	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
51B	.65	.58	.45	.55	.65	.65	.57	.69	.64	.52	.51	.73	.57	.53	.56	.61	.47	.69
54B	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.54	.55	.61	.49	.70
55B	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.50	.73	.58	.54	.55	.61	.49	.70
63B	.65	.58	.45	.56	.64	.65	.57	.68	.64	.51	.50	.72	.57	.54	.55	.61	.47	.69
67N	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
71L	.65	.59	.45	.58	.65	.65	.57	.68	.65	.50	.49	.71	.58	.55	.54	.61	.50	.69
76Y	.65	.58	.45	.57	.65	.65	.58	.68	.65	.50	.49	.72	.57	.55	.54	.61	.49	.69
88M	.65	.58	.45	.57	.65	.65	.57	.68	.65	.50	.50	.72	.57	.54	.55	.61	.49	.69
91A	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.72	.58	.55	.55	.61	.50	.70
94B	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.49	.72	.58	.55	.54	.62	.51	.70
95B	.65	.59	.46	.58	.65	.65	.58	.69	.65	.50	.50	.72	.58	.55	.55	.61	.50	.70

Addendum Appendix Table 27

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & MOS Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.59	.45	.56	.65	.66	.57	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
12B	.65	.59	.45	.56	.65	.66	.57	.68	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
13B	.65	.59	.45	.56	.65	.66	.57	.69	.64	.52	.50	.73	.57	.54	.55	.61	.47	.69
16S	.65	.59	.45	.57	.65	.66	.58	.69	.65	.51	.50	.73	.58	.54	.55	.61	.49	.70
19K	.65	.58	.45	.55	.65	.65	.57	.68	.64	.51	.50	.73	.56	.53	.55	.61	.47	.69
27E	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.57	.55	.55	.62	.49	.70
31C	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.62	.49	.70
51B	.65	.58	.45	.55	.65	.66	.58	.69	.64	.52	.51	.74	.56	.53	.55	.61	.47	.69
54B	.65	.59	.45	.57	.65	.66	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
55B	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.50	.73	.57	.54	.55	.62	.49	.70
63B	.65	.58	.45	.56	.65	.65	.58	.68	.64	.51	.50	.73	.57	.54	.55	.61	.47	.69
67N	.65	.59	.45	.57	.65	.66	.58	.69	.65	.51	.50	.73	.57	.55	.55	.62	.49	.70
71L	.65	.59	.45	.58	.65	.65	.58	.68	.65	.50	.49	.72	.58	.55	.54	.61	.50	.70
76Y	65	.59	.44	.57	.65	.66	.58	.68	.65	.50	.49	.73	.57	.55	.54	.62	.49	.70
88M	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.50	.73	.57	.54	.55	.61	.48	.70
91A	.65	.59	.45	.57	.65	.66	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
94B	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.51	.70
95B	.65	.59	.45	.58	.65	.66	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.50	.70

Addendum Appendix Table 28

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.62	.58	.44	.53	.61	.66	.55	.62	.59	.48	.49	.66	.56	.52	.53	.58	.47	.62
12B	.62	.58	.44	.53	.61	.66	.55	.62	.59	.48	.49	.66	.56	.52	.53	.58	.47	.62
13B	.61	.57	.44	.52	.60	.65	.55	.61	.59	.49	.49	.66	.55	.52	.53	.58	.47	.61
16S	.62	.56	.44	.52	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
19K	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.52	.54	.58	.48	.62
27E	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.49	.62
31C	.62	.56	.44	.52	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
51B	.63	.59	.46	.54	.61	.65	.56	.61	.60	.51	.50	.66	.56	.53	.53	.59	.47	.62
54B	.62	.56	.44	.52	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
55B	.62	.56	.44	.52	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.57	.49	.62
63B	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.48	.62
67N	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.49	.62
71L	.62	.56	.44	.53	.60	.64	.55	.63	.61	.49	.50	.65	.56	.53	.53	.58	.50	.63
76Y	.62	.56	.44	.53	.60	.63	.55	.63	.61	.49	.50	.65	.56	.53	.53	.58	.49	.63
88M	.62	.56	.44	.52	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
91A	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.56	.53	.54	.58	.49	.62
94B	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
95B	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.56	.53	.54	.58	.49	.62

Addendum Appendix Table 29

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.60	.59	.43	.53	.60	.65	.55	.58	.59	.47	.48	.66	.55	.53	.52	.58	.48	.62
12B	.60	.59	.43	.53	.60	.65	.55	.58	.59	.47	.48	.66	.55	.53	.52	.58	.48	.61
13B	.60	.59	.43	.53	.60	.65	.55	.58	.59	.47	.48	.66	.55	.53	.52	.58	.48	.62
16S	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
19K	.63	.59	.46	.53	.61	.67	.57	.64	.62	.51	.52	.69	.57	.54	.54	.60	.49	.64
27E	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.57	.54	.54	.60	.49	.64
31C	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
51B	.61	.59	.45	.54	.60	.64	.56	.57	.60	.51	.49	.67	.56	.54	.53	.59	.48	.62
54B	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
55B	.60	.54	.43	.53	.59	.63	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
63B	.63	.59	.46	.53	.61	.68	.57	.64	.62	.51	.52	.69	.57	.54	.54	.60	.49	.64
67N	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
71L	.60	.57	.43	.55	.61	.64	.54	.61	.61	.46	.48	.65	.57	.54	.52	.58	.52	.65
76Y	.62	.58	.45	.54	.61	.63	.57	.64	.64	.52	.52	.68	.58	.55	.54	.61	.50	.65
88M	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
91A	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
94B	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
95B	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60

Addendum Appendix Table 30

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
12B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
13B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
16S	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
19K	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
27E	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
31C	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
51B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
54B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
55B	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
63B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
67N	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
71L	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
76Y	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
88M	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
91A	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
94B	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
95B	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66

Addendum Appendix Table 31

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.67	.56	.53	.54	.60	.50	.65
12B	.63	.57	.47	.54	.61	.61	.54	.63	.59	.51	.51	.66	.56	.53	.54	.60	.50	.64
13B	.63	.57	.47	.54	.61	.61	.54	.63	.59	.51	.51	.67	.56	.53	.55	.60	.49	.65
16S	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
19K	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.67	.56	.53	.55	.60	.49	.65
27E	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.67	.56	.53	.55	.60	.50	.65
31C	.63	.57	.47	.54	.62	.61	.54	.63	.60	.51	.51	.66	.56	.54	.55	.60	.51	.65
51B	.63	.57	.47	.53	.61	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.49	.64
54B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.67	.56	.53	.55	.60	.50	.65
55B	.63	.57	.47	.53	.61	.61	.54	.62	.59	.51	.51	.67	.56	.53	.55	.60	.49	.64
63B	.63	.57	.47	.54	.62	.61	.55	.63	.59	.51	.51	.67	.56	.53	.55	.60	.49	.65
67N	.63	.57	.47	.54	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.61	.50	.65
71L	.63	.57	.47	.55	.62	.62	.55	.63	.60	.49	.50	.66	.57	.54	.54	.60	.51	.65
76Y	.63	.57	.47	.55	.62	.61	.55	.62	.60	.50	.50	.66	.56	.54	.54	.60	.51	.65
88M	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.67	.56	.53	.55	.60	.49	.65
91A	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.49	.64
94B	.62	.57	.47	.54	.61	.61	.54	.62	.59	.50	.50	.66	.56	.53	.54	.60	.51	.64
95B	.63	.57	.47	.54	.61	.61	.54	.63	.59	.50	.50	.66	.56	.53	.54	.60	.51	.64

Addendum Appendix Table 32

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.55	.44	.54	.63	.62	.55	.67	.61	.48	.47	.70	.55	.51	.52	.58	.43	.66
12B	.65	.58	.46	.56	.65	.65	.56	.68	.63	.50	.50	.71	.57	.53	.55	.60	.47	.69
13B	.64	.57	.45	.53	.63	.65	.55	.67	.60	.51	.50	.71	.54	.51	.55	.60	.43	.67
16S	.64	.57	.45	.55	.64	.63	.56	.67	.62	.49	.49	.71	.56	.52	.54	.59	.46	.68
19K	.63	.56	.44	.52	.62	.63	.55	.66	.61	.49	.48	.71	.54	.50	.53	.58	.42	.67
27E	.64	.57	.45	.56	.64	.63	.57	.66	.63	.51	.50	.72	.56	.53	.54	.60	.46	.69
31C	.65	.59	.46	.57	.65	.65	.58	.68	.65	.51	.51	.73	.58	.54	.55	.61	.49	.70
51B	.62	.56	.44	.51	.62	.63	.55	.64	.59	.51	.50	.71	.53	.49	.55	.58	.42	.66
54B	.63	.56	.44	.54	.63	.63	.55	.66	.61	.48	.47	.70	.54	.51	.53	.58	.44	.67
55B	.60	.53	.41	.50	.60	.61	.53	.62	.59	.49	.47	.69	.50	.48	.52	.58	.41	.65
63B	.61	.54	.42	.51	.61	.61	.54	.63	.60	.49	.48	.70	.52	.48	.52	.57	.40	.66
67N	.64	.58	.44	.56	.65	.65	.57	.67	.64	.52	.51	.73	.56	.54	.55	.62	.47	.70
71L	.61	.52	40	.53	.60	.59	.53	.62	.61	.44	.43	.65	.52	.50	.49	.57	.44	.65
76Y	.57	.49	.37	.48	.56	.57	.51	.57	.57	.44	.42	.62	.47	.49	.47	.57	.44	.60
88M	.60	.53	.42	.51	.60	.61	.53	.62	.58	.48	.47	.69	.51	.47	.52	.56	.40	.65
91A	.62	.54	.44	.53	.62	.61	.54	.65	.60	.48	.47	.68	.53	.49	.52	.57	.42	.66
94B	.63	.56	.45	.55	.63	.61	.56	.65	.63	.49	.49	.67	.55	.53	.54	.61	.50	.67
95B	.65	.58	.46	.56	.64	.64	.56	.68	.63	.50	.49	.71	.57	.53	.54	.60	.49	.68

Addendum Appendix Table 33

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & MOS Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.56	.44	.53	.63	.63	.55	.67	.61	.48	.47	.70	.55	.51	.52	.58	.43	.67
12B	.65	.58	.46	.56	.65	.66	.56	.68	.63	.51	.50	.72	.57	.53	.55	.60	.47	.69
13B	.63	.57	.45	.53	.63	.65	.55	.67	.60	.51	.50	.72	.54	.51	.55	.60	.43	.67
16S	.64	.57	.45	.55	.64	.64	.56	.68	.63	.50	.49	.71	.56	.53	.54	.59	.46	.68
19K	.63	.56	.44	.52	.62	.63	.55	.66	.61	.50	.48	.71	.54	.50	.53	.58	.42	.67
27E	.64	.58	.45	.55	.64	.64	.57	.66	.63	.51	.50	.72	.56	.53	.55	.60	.46	.69
31C	.65	.59	.46	.57	.65	.66	.58	.68	.65	.52	.51	.74	.58	.55	.55	.61	.48	.70
51B	.62	.56	.44	.51	.62	.64	.55	.64	.59	.51	.50	.71	.53	.50	.55	.59	.42	.66
54B	.63	.56	.44	.54	.63	.64	.55	.66	.62	.49	.48	.71	.54	.51	.53	.58	.44	.67
55B	.60	.53	.41	.49	.60	.62	.54	.62	.59	.50	.48	.70	.50	.49	.52	.58	.41	.65
63B	.61	.54	.42	.51	.61	.62	.54	.63	.60	.49	.48	.71	.52	.49	.53	.57	.40	.66
67N	.64	.59	.44	.56	.65	.66	.58	.67	.65	.53	.51	.74	.56	.54	.55	.63	.47	.70
71L	.61	.53	.40	.54	.60	.61	.54	.62	.62	.45	.44	.66	.53	.50	.49	.57	.44	.65
76Y	.57	.50	.37	.49	.57	.59	.51	.58	.58	.45	.42	.63	.48	.50	.47	.57	.45	.61
88M	.61	.54	.42	.51	.60	.62	.53	.62	.59	.48	.47	.70	.51	.47	.52	.56	.40	.65
91A	.62	.55	.44	.53	.62	.61	.54	.65	.60	.48	.48	.69	.53	.49	.53	.57	.42	.66
94B	.63	.56	.44	.55	.63	.62	.56	.65	.63	.50	.49	.68	.55	.54	.54	.61	.50	.67
95B	.65	.58	.46	.56	.64	.65	.56	.68	.63	.50	.49	.72	.57	.53	.54	.60	.48	.69

Addendum Appendix Table 34

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & MOS Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
12B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
13B	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.56
16S	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
19K	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.48	.66
27E	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
31C	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
51B	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
54B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.48	.66
55B	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
63B	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.46	.77	.53	.54	.51	.58	.47	.66
67N	.59	.59	.38	.51	.60	.70	.58	.65	.63	.49	.45	.77	.53	.54	.51	.58	.47	.66
71L	.58	.58	.38	.52	.60	.70	.58	.65	.63	.48	.44	.75	.54	.54	.49	.57	.48	.65
76Y	.59	.59	.38	.52	.60	.70	.58	.65	.64	.48	.44	.76	.54	.54	.50	.58	.48	.66
88M	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
91A	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.48	.66
94B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
95B	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66

Addendum Appendix Table 35

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
12B	.63	57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
13B	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
16S	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
19K	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
27E	.63	.57	.47	.55	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.60	.51	.65
31C	.63	.57	.47	.55	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.60	.51	.65
51B	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
54B	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65
55B	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
63B	.63	.57	.47	.55	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.60	.51	.65
67N	.63	.57	.47	.55	.62	.61	.55	.63	.60	.51	.51	.67	.56	.54	.55	.60	.51	.65
71L	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
76Y	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
88M	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
91A	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
94B	.63	.57	.47	.55	.62	.61	.54	.63	.60	.50	.51	.66	.57	.54	.55	.60	.51	.65
95B	.63	.57	.47	.55	.62	.61	.54	.63	.59	.51	.51	.66	.56	.54	.55	.60	.51	.65

Addendum Appendix Table 36

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
12B	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
13B	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
16S	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
19K	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
27E	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
31C	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
51B	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
54B	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69
55B	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.50	.72	.58	.55	.54	.61	.50	.70
63B	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
67N	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.58	.55	.55	.61	.49	.70
71L	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.50	.72	.58	.55	.54	.61	.50	.70
76Y	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.50	.72	.58	.55	.54	.61	.50	.70
88M	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.50	.72	.58	.55	.54	.61	.50	.70
91A	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.50	.72	.58	.55	.54	.61	.50	.70
94B	.65	.59	.45	.57	.65	.65	.58	.68	.65	.50	.50	.72	.58	.55	.54	.61	.50	.70
95B	.65	.59	.46	.56	.65	.65	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.69

Addendum Appendix Table 37

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & Cluster Mean Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
12B	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
13B	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
16S	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
19K	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
27E	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.57	.55	.55	.62	.49	.70
31C	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.57	.55	.55	.62	.49	.70
51B	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
54B	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70
55B	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.50	.70
63B	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.57	.55	.55	.62	.49	.70
67N	.65	.59	.45	.57	.65	.65	.58	.69	.65	.51	.50	.73	.57	.55	.55	.62	.49	.70
71L	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.50	.70
76Y	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.50	.70
88M	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.50	.70
91A	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.50	.70
94B	.65	.59	.45	.57	.65	.66	.58	.68	.65	.51	.49	.73	.58	.55	.54	.62	.50	.70
95B	.65	.59	.45	.56	.65	.66	.58	.69	.64	.51	.50	.73	.57	.54	.55	.61	.48	.70

Addendum Appendix Table 38

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights, .95 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
12B	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
13B	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
16S	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
19K	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
27E	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.49	.62
31C	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.49	.62
51B	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
54B	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62
55B	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
63B	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.49	.62
67N	.62	.56	.44	.52	.60	.67	.54	.63	.60	.49	.49	.66	.55	.53	.54	.58	.49	.62
71L	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
76Y	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
88M	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
91A	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
94B	.62	.56	.44	.53	.60	.67	.54	.63	.60	.48	.49	.66	.55	.53	.54	.58	.49	.62
95B	.61	.56	.44	.52	.60	.61	.55	.60	.60	.48	.49	.66	.55	.52	.52	.58	.48	.62

Addendum Appendix Table 39

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights, Top 5 Stepwise Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To: 11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
12B	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
13B	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
16S	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
19K	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
27E	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
31C	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
51B	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
54B	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63
55B	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
63B	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
67N	.63	.59	.46	.53	.61	.68	.57	.64	.63	.51	.52	.69	.58	.54	.54	.60	.49	.64
71L	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
76Y	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
88M	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
91A	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
94B	.60	.54	.43	.53	.59	.62	.51	.60	.57	.43	.46	.60	.55	.51	.52	.54	.50	.60
95B	.60	.58	.42	.54	.60	.61	.55	.58	.60	.47	.48	.65	.56	.53	.52	.58	.49	.63

Addendum Appendix Table 40

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Mean Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
12B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
13B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
16S	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
19K	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
27E	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
31C	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
51B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
54B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66
55B	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
63B	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
67N	.59	.59	.38	.52	.60	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
71L	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
76Y	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
88M	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
91A	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
94B	.58	.59	.38	.52	.60	.70	.58	.65	.63	.48	.44	.76	.54	.54	.50	.58	.48	.66
95B	.59	.59	.3[illegible]	.52	.60	.70	.58	.65	.63	.48	.45	.76	.54	.54	.50	.58	.48	.66

Addendum Appendix Table 41

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
12B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
13B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
16S	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
19K	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
27E	.63	.57	.47	.54	.61	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
31C	.63	.57	.47	.54	.61	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
51B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
54B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
55B	.63	.57	.47	.54	.61	.61	.54	.62	.59	.51	.51	.66	.56	.53	.54	.60	.49	.64
63B	.63	.57	.47	.54	.61	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
67N	.63	.57	.47	.54	.61	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65
71L	.63	.57	.47	.54	.61	.61	.54	.62	.59	.51	.51	.66	.56	.53	.54	.60	.49	.64
76Y	.63	.57	.47	.54	.61	.61	.54	.62	.59	.51	.51	.66	.56	.53	.54	.60	.49	.64
88M	.63	.57	.47	.54	.61	.61	.54	.62	.59	.51	.51	.66	.56	.53	.54	.60	.49	.64
91A	.63	.57	.47	.54	.61	.61	.54	.62	.59	.51	.51	.66	.56	.53	.54	.60	.49	.64
94B	.63	.57	.47	.54	.61	.61	.54	.62	.59	.51	.51	.66	.56	.53	.54	.60	.49	.64
95B	.63	.57	.47	.54	.62	.61	.54	.63	.59	.51	.51	.66	.56	.53	.55	.60	.50	.65

Addendum Appendix Table 42

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-1 Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
12B	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
13B	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
16S	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
19K	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
27E	.63	.57	.45	.55	.63	.64	.55	.65	.62	.50	.50	.71	.55	.51	.54	.60	.45	.68
31C	.63	.57	.45	.55	.63	.64	.55	.65	.62	.50	.50	.71	.55	.51	.54	.60	.45	.68
51B	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
54B	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68
55B	.60	.52	.43	.51	.61	.59	.53	.64	.60	.48	.47	.67	.51	.47	.51	.56	.39	.65
63B	.63	.57	.45	.55	.63	.64	.55	.65	.62	.50	.50	.71	.55	.51	.54	.60	.45	.68
67N	.63	.57	.45	.55	.63	.64	.55	.65	.62	.50	.50	.71	.55	.51	.54	.60	.45	.68
71L	.60	.52	.43	.51	.61	.59	.53	.64	.60	.48	.47	.67	.51	.47	.51	.56	.39	.65
76Y	.60	.52	.43	.51	.61	.59	.53	.64	.60	.48	.47	.67	.51	.47	.51	.56	.39	.65
88M	.60	.52	.43	.51	.61	.59	.53	.64	.60	.48	.47	.67	.51	.47	.51	.56	.39	.65
91A	.60	.52	.43	.51	.61	.59	.53	.64	.60	.48	.47	.67	.51	.47	.51	.56	.39	.65
94B	.60	.52	.43	.51	.61	.59	.53	.64	.60	.48	.47	.67	.51	.47	.51	.56	.39	.65
95B	.64	.57	.46	.55	.64	.63	.56	.67	.62	.50	.49	.71	.56	.52	.54	.59	.45	.68

Addendum Appendix Table 43

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, 0-Mean Attribute Weights & Cluster Threshold Component Weights

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
12B	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
13B	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
16S	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
19K	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
27E	.63	.57	.45	.55	.63	.65	.56	.65	.62	.51	.50	.72	.55	.51	.55	.60	.45	.69
31C	.63	.57	.45	.55	.63	.65	.56	.65	.62	.51	.50	.72	.55	.51	.55	.60	.45	.69
51B	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
54B	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68
55B	.61	.53	.43	.52	.62	.60	.54	.64	.60	.49	.48	.69	.52	.48	.52	.57	.40	.66
63B	.63	.57	.45	.55	.63	.65	.56	.65	.62	.51	.50	.72	.55	.51	.55	.60	.45	.69
67N	.63	.57	.45	.55	.63	.65	.56	.65	.62	.51	.50	.72	.55	.51	.55	.60	.45	.69
71L	.61	.53	.43	.52	.62	.60	.54	.64	.60	.49	.48	.69	.52	.48	.52	.57	.40	.66
76Y	.61	.53	.43	.52	.62	.60	.54	.64	.60	.49	.48	.69	.52	.48	.52	.57	.40	.66
88M	.61	.53	.43	.52	.62	.60	.54	.64	.60	.49	.48	.69	.52	.48	.52	.57	.40	.66
91A	.61	.53	.43	.52	.62	.60	.54	.64	.60	.49	.48	.69	.52	.48	.52	.57	.40	.66
94B	.61	.53	.43	.52	.62	.60	.54	.64	.60	.49	.48	.69	.52	.48	.52	.57	.40	.66
95B	.64	.58	.45	.55	.64	.64	.56	.68	.62	.50	.49	.71	.56	.52	.54	.59	.46	.68

Addendum Appendix Table 44

Validities of Synthetically Formed Prediction Equations for 18 MOS: Overall Performance, Mean Attribute Validities & Cluster Threshold Component Weights, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
12B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
13B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
16S	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
19K	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
27E	.59	.59	.38	.51	.60	.70	.58	.65	.63	.49	.45	.77	.54	.54	.50	.58	.47	.66
31C	.59	.59	.38	.51	.60	.70	.58	.65	.63	.49	.45	.77	.54	.54	.50	.58	.47	.66
51B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
54B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66
55B	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
63B	.59	.59	.38	.51	.60	.70	.58	.65	.63	.49	.45	.77	.54	.54	.50	.58	.47	.66
67N	.59	.59	.38	.51	.60	.70	.58	.65	.63	.49	.45	.77	.54	.54	.50	.58	.47	.66
71L	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
76Y	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
88M	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
91A	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
94B	.59	.59	.38	.51	.61	.70	.58	.65	.63	.49	.45	.77	.54	.54	.51	.58	.47	.66
95B	.59	.59	.38	.52	.61	.70	.58	.65	.63	.49	.45	.76	.54	.54	.50	.58	.48	.66

Addendum Appendix Table 45

Validities of Least Squares Prediction Equations for 18 MOS: Core Technical Proficiency, No Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.75	.64	.46	.54	.65	.68	.58	.81	.69	.63	.59	.76	.53	.58	.59	.73	.63	.64
12B	.68	.71	.41	.49	.62	.65	.58	.75	.70	.67	.62	.79	.49	.58	.59	.70	.64	.61
13B	.67	.57	.51	.49	.60	.62	.48	.77	.62	.59	.62	.68	.44	.47	.55	.67	.51	.56
16S	.67	.57	.42	.60	.59	.62	.57	.71	.69	.56	.46	.66	.61	.58	.51	.68	.63	.62
19K	.71	.64	.45	.52	.68	.68	.57	.82	.68	.60	.61	.75	.52	.58	.60	.74	.62	.63
27E	.61	.54	.38	.44	.55	.84	.50	.79	.64	.53	.49	.64	.43	.54	.46	.65	.55	.55
31C	.65	.61	.36	.51	.57	.62	.68	.65	.68	.60	.52	.70	.54	.62	.53	.67	.64	.57
51B	.64	.56	.41	.46	.59	.70	.47	.95	.62	.50	.51	.68	.48	.51	.52	.66	.60	.61
54B	.67	.64	.41	.54	.60	.70	.59	.77	.77	.63	.55	.72	.57	.60	.55	.72	.66	.64
55B	.64	.64	.41	.46	.56	.60	.55	.65	.67	.74	.61	.75	.42	.51	.55	.67	.54	.57
63B	.61	.60	.44	.38	.58	.57	.49	.66	.59	.62	.72	.70	.33	.45	.58	.63	.45	.50
67N	.67	.66	.41	.47	.61	.63	.56	.76	.66	.65	.60	.85	.47	.53	.57	.70	.61	.61
71L	.59	.52	.33	.55	.53	.54	.54	.68	.65	.46	.35	.59	.67	.60	.46	.63	.71	.60
76Y	.63	.60	.35	.51	.58	.66	.61	.70	.68	.55	.47	.66	.59	.68	.53	.68	.71	.61
88M	.69	.66	.44	.49	.65	.60	.56	.77	.67	.63	.66	.76	.49	.56	.64	.71	.62	.62
91A	.70	.63	.44	.53	.65	.70	.58	.80	.71	.63	.59	.76	.55	.59	.58	.78	.64	.65
94B	.61	.59	.33	.50	.55	.60	.56	.73	.66	.51	.42	.67	.62	.63	.51	.65	.77	.62
95B	.69	.62	.41	.54	.62	.67	.56	.84	.71	.60	.53	.74	.59	.60	.57	.73	.69	.69

Addendum Appendix Table 46

Validities of Least Squares Prediction Equations for 18 MOS: Core Technical Proficiency, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.69	.67	.40	.50	.62	.72	.62	.80	.70	.64	.57	.79	.51	.61	.57	.72	.67	.63
12B	.68	.68	.40	.46	.62	.69	.59	.78	.68	.66	.61	.81	.46	.57	.59	.70	.62	.61
13B	.69	.67	.41	.49	.63	.69	.61	.78	.69	.64	.60	.80	.49	.61	.59	.70	.66	.62
16S	.65	.58	.37	.53	.57	.71	.61	.76	.68	.55	.44	.69	.58	.64	.50	.68	.70	.62
19K	.69	.67	.41	.49	.63	.70	.61	.79	.69	.64	.60	.80	.49	.61	.59	.71	.66	.63
27E	.68	.64	.39	.52	.60	.73	.62	.79	.70	.62	.50	.76	.55	.62	.54	.71	.68	.64
31C	.68	.64	.40	.52	.61	.72	.62	.79	.70	.61	.53	.76	.55	.64	.56	.71	.70	.64
51B	.69	.66	.40	.51	.62	.72	.62	.80	.70	.64	.55	.79	.53	.62	.57	.72	.68	.64
54B	.69	.65	.40	.52	.61	.73	.62	.80	.70	.63	.53	.77	.54	.63	.56	.72	.68	.64
55B	.67	.67	.39	.44	.61	.68	.57	.76	.66	.67	.60	.80	.43	.55	.57	.70	.59	.60
63B	.61	.63	.38	.36	.57	.56	.50	.67	.57	.61	.65	.77	.32	.47	.57	.61	.51	.52
67N	.68	.68	.40	.45	.62	.68	.58	.77	.67	.66	.62	.81	.44	.57	.59	.70	.62	.61
71L	.60	.52	.34	.53	.52	.68	.58	.71	.64	.48	.36	.61	.59	.63	.45	.63	.69	.59
76Y	.66	.60	.38	.53	.59	.71	.62	.77	.69	.56	.48	.71	.57	.64	.53	.68	.70	.63
88M	.67	.67	.40	.45	.62	.66	.58	.76	.66	.64	.63	.80	.44	.57	.60	.68	.62	.60
91A	.69	.66	.40	.50	.62	.73	.61	.80	.70	.64	.55	.79	.52	.61	.56	.72	.67	.63
94B	.66	.60	.38	.53	.59	.71	.62	.77	.68	.56	.47	.71	.58	.64	.52	.68	.70	.63
95B	.69	.65	.40	.52	.61	.73	.62	.79	.70	.62	.53	.77	.55	.63	.56	.72	.69	.64

Addendum Appendix Table 47

Validities of Least Squares Prediction Equations for 18 MOS: Overall Performance, No Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.69	.63	.49	.61	.69	.69	.61	.74	.66	.53	.54	.74	.63	.58	.58	.64	.51	.72
12B	.63	.69	.46	.59	.67	.71	.61	.64	.66	.52	.55	.76	.62	.58	.56	.64	.51	.69
13B	.64	.60	.53	.58	.65	.65	.57	.68	.63	.53	.55	.68	.61	.55	.56	.63	.51	.67
16S	.63	.61	.46	.66	.68	.64	.57	.69	.66	.46	.49	.68	.62	.55	.51	.61	.55	.69
19K	.65	.64	.48	.62	.72	.70	.61	.80	.68	.47	.53	.73	.63	.57	.57	.65	.52	.71
27E	.56	.58	.40	.50	.60	.84	.53	.69	.57	.40	.45	.70	.54	.50	.49	.57	.46	.59
31C	.63	.63	.45	.56	.66	.67	.67	.70	.68	.50	.52	.76	.61	.57	.57	.62	.50	.67
51B	.54	.46	.38	.48	.61	.61	.50	.94	.53	.36	.39	.59	.51	.45	.48	.50	.41	.58
54B	.63	.62	.45	.60	.68	.66	.62	.69	.73	.50	.52	.73	.62	.58	.54	.63	.53	.69
55B	.56	.55	.43	.46	.52	.51	.51	.51	.56	.65	.53	.67	.50	.49	.52	.56	.38	.61
63B	.61	.61	.47	.53	.63	.62	.57	.61	.61	.56	.61	.71	.58	.54	.59	.62	.44	.67
67N	.61	.63	.43	.54	.64	.71	.61	.67	.64	.53	.53	.83	.58	.53	.56	.62	.47	.69
71L	.66	.65	.48	.62	.69	.69	.62	.73	.68	.49	.54	.73	.66	.59	.57	.64	.54	.71
76Y	.64	.64	.47	.58	.66	.67	.61	.69	.68	.52	.53	.71	.62	[illegible]	.57	.64	.56	.69
88M	.65	.62	.47	.54	.66	.66	.61	.72	.62	.54	.58	.74	.60	.57	.62	.63	.49	.70
91A	.64	.64	.48	.58	.67	.69	.59	.68	.66	.52	.55	.74	.61	.58	.57	.69	.53	.70
94B	.55	.55	.42	.56	.59	.60	.51	.60	.60	.39	.43	.61	.55	.55	.48	.57	.64	.62
95B	.66	.63	.47	.61	.68	.66	.60	.73	.67	.53	.54	.76	.62	.57	.58	.65	.53	.75

Addendum Appendix Table 48

Validities of Least Squares Prediction Equations for 18 MOS: Overall Performance, ASVAB Reduction

MOS Equation Was Developed On	MOS Equation Was Applied To																	
	11B	12B	13B	16S	19K	27E	31C	51B	54B	55B	63B	67N	71L	76Y	88M	91A	94B	95B
11B	.59	.59	.40	.51	.61	.68	.60	.66	.64	.49	.46	.76	.54	.55	.52	.58	.49	.67
12B	.59	.59	.39	.51	.61	.69	.59	.66	.63	.50	.46	.77	.54	.54	.52	.58	.48	.67
13B	.58	.58	.40	.50	.61	.64	.59	.65	.62	.48	.46	.73	.54	.54	.53	.57	.50	.66
16S	.57	.57	.38	.53	.59	.67	.57	.64	.63	.44	.40	.71	.54	.54	.47	.55	.52	.63
19K	.59	.59	.40	.51	.61	.68	.60	.66	.63	.49	.46	.76	.54	.55	.52	.58	.49	.67
27E	.58	.58	.37	.51	.59	.70	.57	.64	.63	.48	.44	.76	.53	.53	.49	.57	.46	.65
31C	.59	.59	.40	.51	.61	.67	.60	.66	.63	.49	.46	.75	.54	.55	.53	.58	.50	.66
51B	.59	.59	.40	.52	.61	.68	.60	.66	.64	.49	.45	.76	.54	.55	.52	.58	.49	.67
54B	.59	.59	.35	.53	.61	.69	.59	.66	.64	.48	.44	.75	.55	.55	.50	.57	.50	.66
55B	.57	.57	.38	.45	.59	.65	.57	.62	.59	.51	.49	.77	.50	.50	.53	.57	.41	.65
63B	.56	.56	.38	.44	.58	.63	.56	.61	.57	.51	.49	.76	.49	.49	.54	.56	.40	.64
67N	.58	.59	.38	.48	.60	.68	.57	.64	.61	.51	.48	.78	.52	.52	.52	.58	.43	.66
71L	.59	.59	.39	.53	.61	.68	.59	.65	.64	.47	.44	.74	.55	.55	.51	.57	.51	.66
76Y	.59	.59	.40	.52	.61	.67	.59	.66	.64	.47	.44	.74	.55	.55	.51	.57	.51	.66
88M	.57	.57	.39	.46	.59	.63	.58	.63	.59	.50	.48	.75	.51	.51	.54	.57	.44	.65
91A	.59	.59	.39	.50	.61	.69	.59	.65	.63	.50	.47	.78	.53	.53	.53	.59	.46	.67
94B	.55	.53	.38	.52	.57	.61	.56	.61	.60	.40	.37	.63	.52	.53	.45	.51	.53	.60
95B	.59	.59	.40	.50	.61	.68	.59	.65	.63	.50	.47	.77	.54	.54	.53	.58	.48	.67